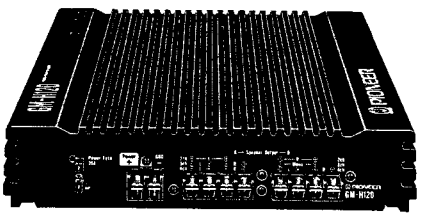
PIONEER®
The Art of Entertainment

Service Manual

• GM-H120/UC



ORDER NO.
CRT1377

BRIDGEABLE FOUR-CHANNEL POWER AMPLIFIER

GM-H120 UC
GM-3400 EW

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SAFETY INFORMATION (UC MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SPECIFICATIONS

• GM-H120/UC

Power source .....14.4 V DC (10.8 - 15.6 V allowable)
Grounding system .....Negative type
Current consumption.....17 A (at continuous power, 4Ω)
Fuse .....30 A
Dimensions.....264 (W) × 52 (H) × 335 (D) mm
[10 - 3/8 (W) × 2 (H) × 13 - 1/4 (D) in.]
Weight .....4.9 kg (10.8 lbs.)(Leads for wiring not included)
Maximum power output
.....60 W × 4/180 W × 2/60 W × 2 + 180 W × 1(EIAJ)
Continuous power output
.....30 W × 4/90 W × 2 (at 4Ω, 20 - 20,000 Hz, 0.05% THD)
45 W × 4 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance .....4Ω (2 - 8Ω allowable)
Frequency response .....10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio.....100 dB (IHF - A network)
Distortion .....0.003% (at 10 W, 1 kHz)
Separation .....60 dB (1 kHz)
Input level .....0.2 - 2 V /8 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

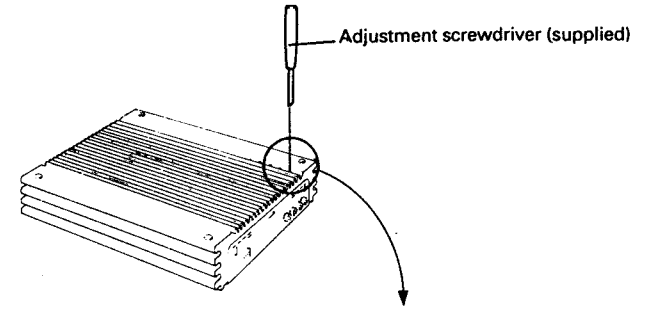
Note:
Specifications and the design are subject to possible modification without notice due to improvements.

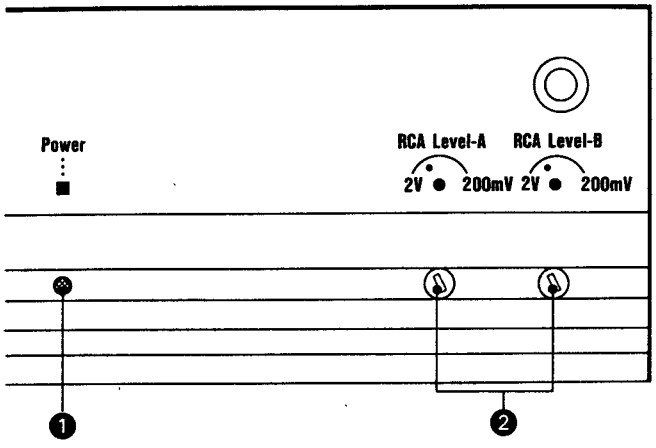
• GM-3400/EW

Power source .....14.4 V DC (10.8 - 15.6 V allowable)
Grounding system .....Negative type
Current consumption .....17 A (at continuous power, 4Ω)
Fuse .....30 A
Dimensions .....264 (W) × 52 (H) × 335 (D) mm
Weight .....4.9 kg (Leads for wiring not included)
Maximum power output
.....80 W × 4/180 W × 2/60 W × 2 + 180 W × 1 (EIAJ)
Continuous power output
.....40 W × 4/90 W × 2 (at 4Ω, 20 - 20,000 Hz, 0.05% THD)
45 W × 4 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance .....4Ω (2 - 8Ω allowable)
Frequency response .....10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio .....103 dB (IEC - A network)
Distortion .....0.003% (at 10 W, 1 kHz)
Separation .....60 dB (1 kHz)
Input level .....RCA: 0.4-4 V/8 kΩ
DIN: 70-500 mV/22 kΩ

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

2. CONTROLS AND THEIR USE (UC MODEL)





❶ Power Indicator

The power indicator lights when the power is switched on.

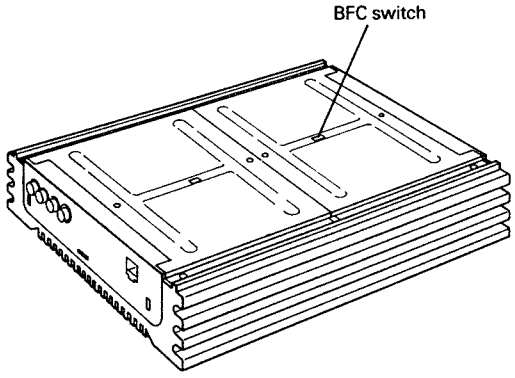
❷ RCA Input Level Controls A and B

Input level control A is used to adjust the volume of speaker output A; Input level control B is used to adjust the volume of speaker output B. Normally, allgn th dots • on the controls with the marks. If the output is low even when the volume of the car stereo is turned up, turn these controls clockwise. If there is distortion when the volume of the car stereo is turned up, turn these controls counter-clockwise.

- Adjust controls ❷ with the supplied adjustment screwdriver. Keep the screwdriver in case you need to readjust the controls later.

BFC (Beat Frequency Control) switch

If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



3. CONNECTING THE UNITS (UC MODEL)

Connect the components as shown in the diagram.

- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

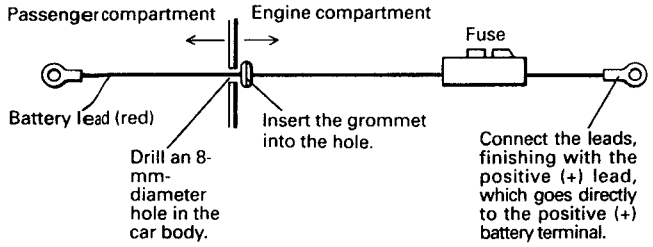
Mode	Speaker ratings
4-channel	Maximum: 60 W Nominal: 30 W
2-channel	Maximum: 180 W Nominal: 90 W
3-channel Speaker output (A)	Maximum: 60 W Nominal: 30 W
Speaker output (B)	Maximum: 180 W Nominal: 90 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the power leads to the amplifier away from the signal cords (RCA cords) and speaker leads. Also, keep the power leads away from any antenna cords.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the battery lead and the accessory power lead (red / black) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.

Connecting the battery lead (red)

Route the battery lead (red) from the engine compartment to the passenger compartment to connect it to the amplifier. To prevent a short circuit, do not connect the positive (+) lead of the battery until the other leads have been connected.


Passenger compartment
Engine compartment
Fuse
Battery lead (red)
Insert the grommet into the hole.
Drill an 8-mm-diameter hole in the car body.
Connect the leads, finishing with the positive (+) lead, which goes directly to the positive (+) battery terminal.

Connection of speaker leads and input leads

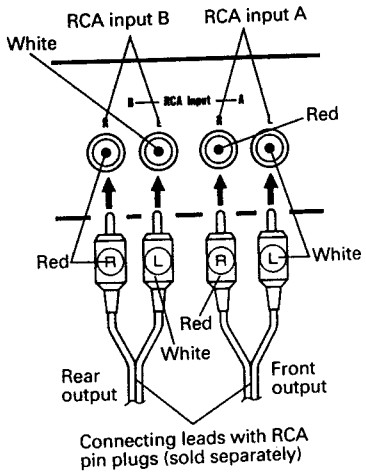
Either 4-channel mode (2 inputs/4 speakers or 1 input/4 speakers), 2-channel mode (1 input/2 speakers), or 3-channel mode (2 inputs/3 speakers) can be selected for the speaker output. The way the speaker leads and RCA input cords are connected depends on the mode used.

4-channel mode, type 1	• Inputs A and B (2 inputs) • 4-speaker (front/rear) output	Page 5
4-channel mode, type 2	• Input A (1 input) • 4-speaker (2 stereo pairs) output	Page 5
2-channel mode	• Input A (1 input) • 2-speaker output	Page 6
3-channel mode	• Inputs A and B (2 inputs) • 2-speaker (stereo) plus 1 speaker (mono) output	Page 6

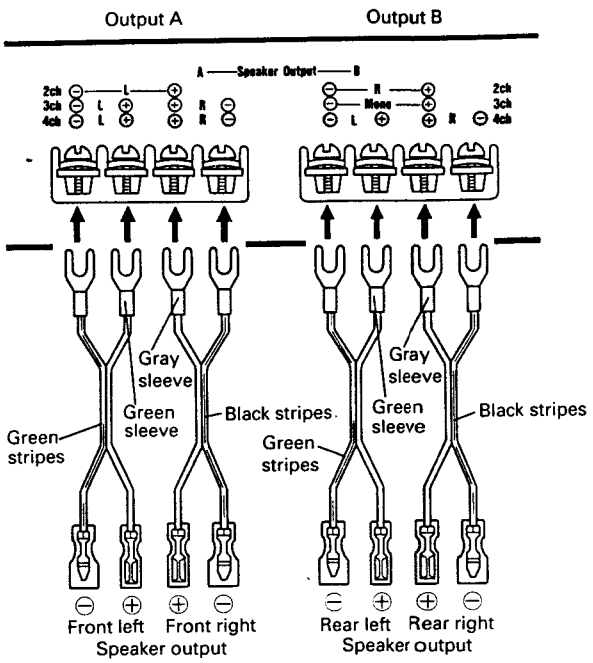
Connection of speaker and RCA input leads when the amplifier is connected to a car component with RCA pin jacks

When using 4-channel mode type 1

(Rear of amplifier)



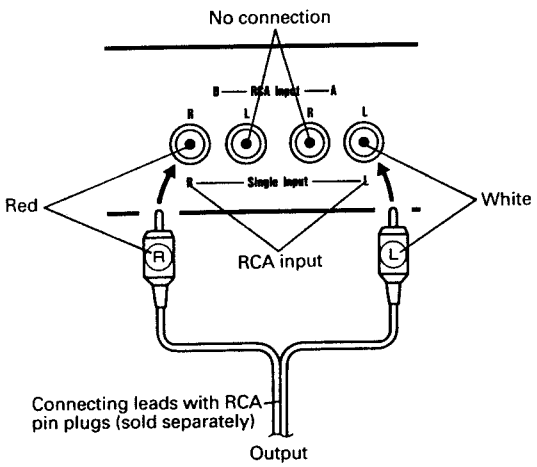
(Front of amplifier)



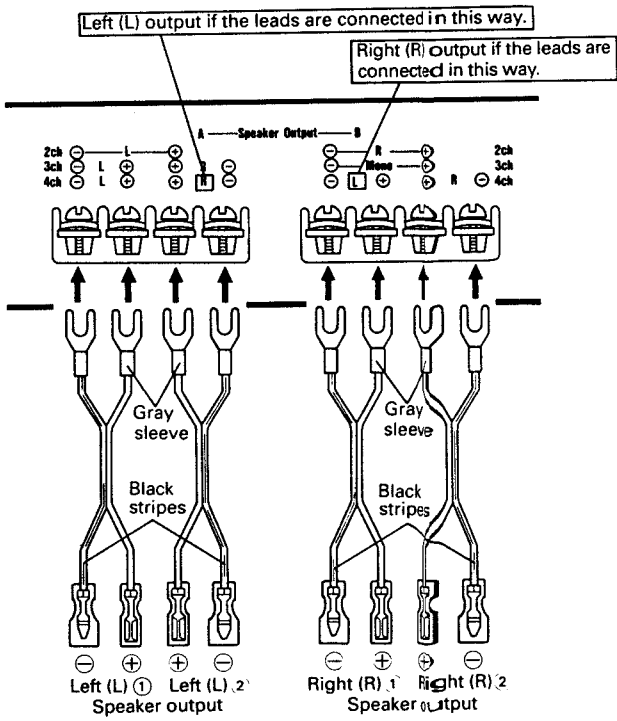
When using 4-channel mode type 2

- With this connection, the left (L) and right (R) positions of the speaker terminals on the front of the amplifier are slightly different from the positions indicated.
- The left (L) ① and right (R) ① speaker leads to stereo output ①, and the left (L) ② and right (R) ② speaker leads to stereo output ② (two pairs of stereo outputs).
- Connect the RCA outputs of the car component to the RCA inputs marked Single Input on the rear of the amplifier.
- If the RCA input levels are adjusted, set input level controls A and B to the same position.

(Rear of amplifier)



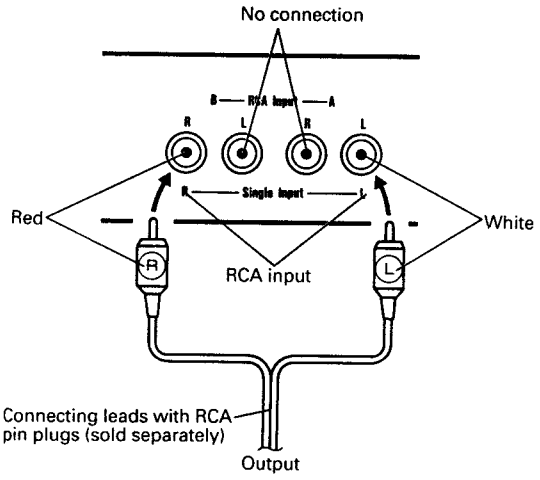
(Front of amplifier)


Left (L) output if the leads are connected in this way.
Right (R) output if the leads are connected in this way.
Gray sleeve
Black stripes
Left (L) ①
Left (L) ②
Speaker output
Right (R) ①
Right (R) ②
Speaker output

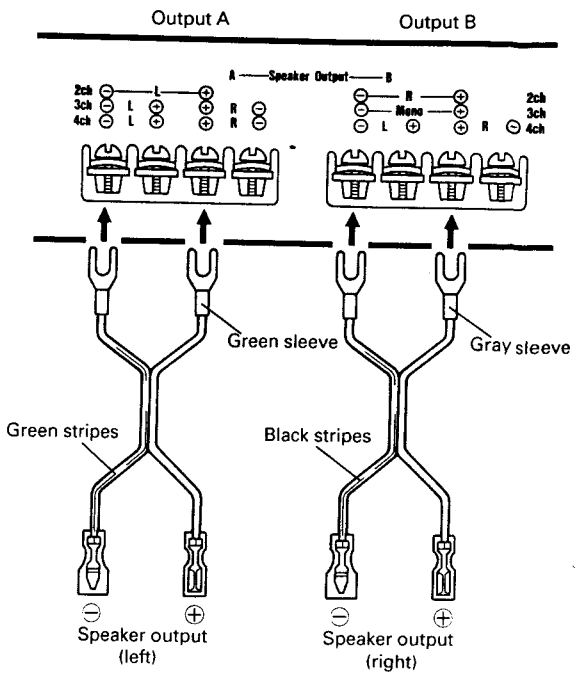
When using 2-channel mode

- Connect the RCA outputs of the car component to the RCA inputs marked Single Input on the rear of the amplifier.
- If the RCA input levels are adjusted, set input level controls A and B to the same position.

(Rear of amplifier)

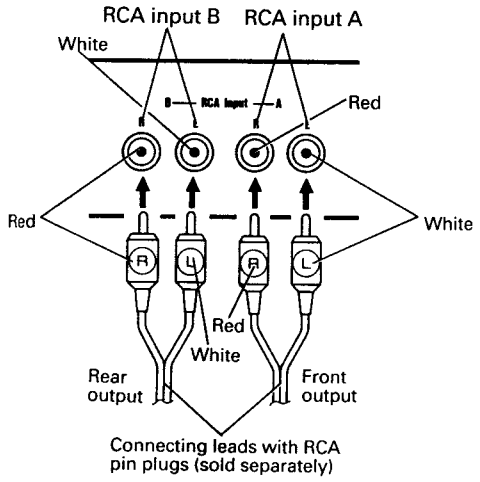


(Front of amplifier)

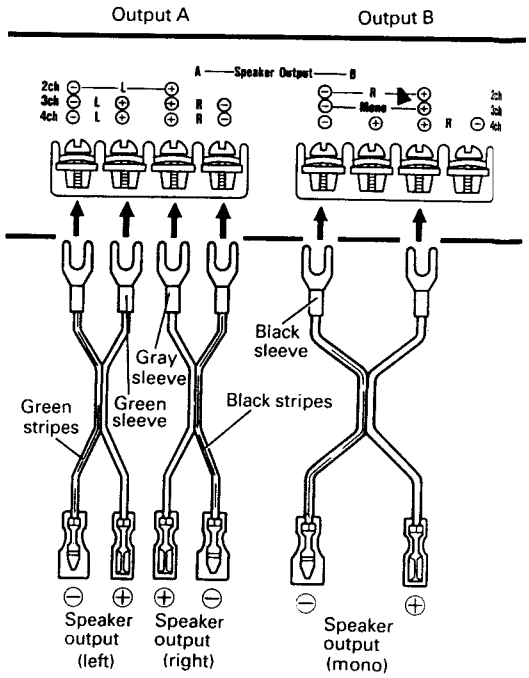


When using 3-channel mode

(Rear of amplifier)



(Front of amplifier)

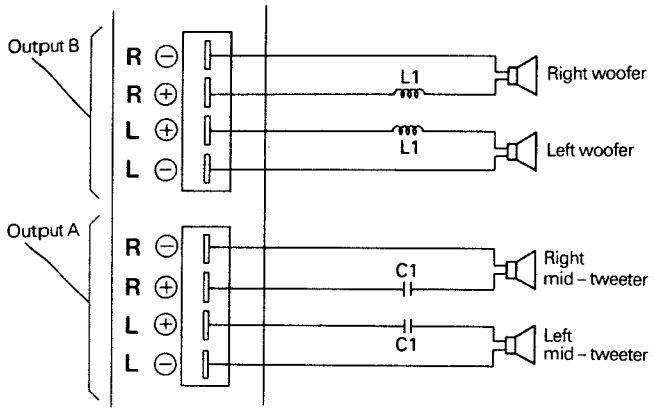


Multi Channel System with Passive Network

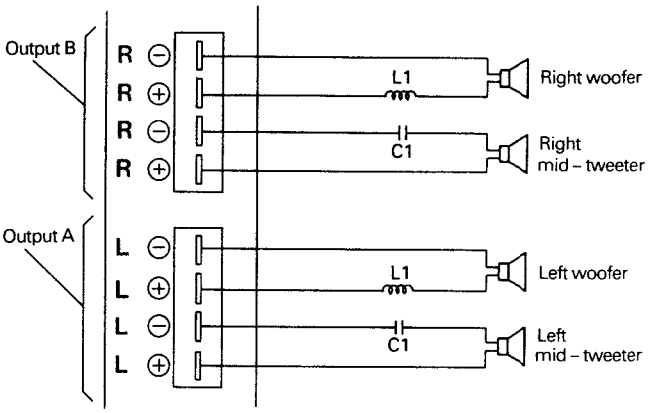
This power amplifier can be used to set up a multi channel system with additonal inductors and capacitors. The connectors for 4-channel mode are shown in example 1-3.

- As making this connection does require a knowledge of electronics, get it done by your dealer or by someone specializing in such work.

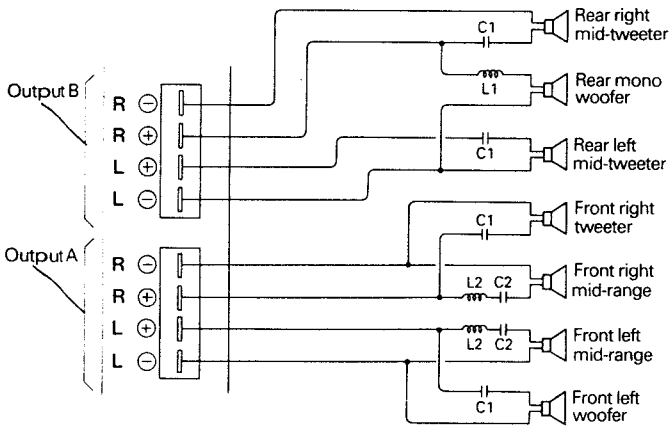
Example 1: 2-way system [4-channel mode, type 1(2 inputs)]



Example 2: 2-way system [4-channels mode, type 2(1 input)]



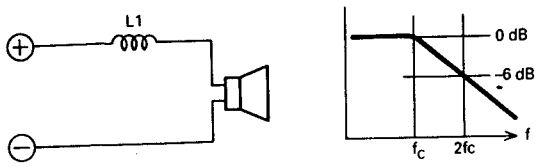
Example 3: Multi-way system [4-channel mode, type 1 (2 inputs)]



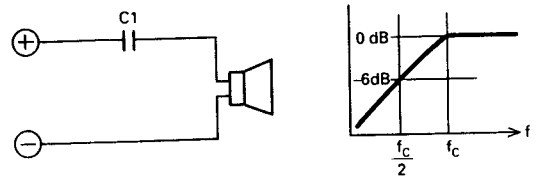
- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. Connect the inductors (L) to the woofer, and the capacitor (C) to the mid-tweeter/tweeter unit.
- Even if the impedance of each connected speakers if 4Ω, low-pass and high-pass filters must still be used. If not, the total speaker impedance wil be 2Ω or less, causing amplifier problems.
- If the inductors and capacitors are connected to the speaker leads, secure or solder them so they cannot be pulled loose. Tape the joints to prevents short circuits.

Setting the filter constant

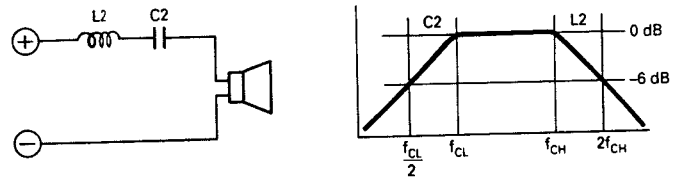
① **Low-pass filter (for woofer): 6 dB/octave**



② **High-pass filter (for mid-tweeter/tweeter): 6 dB/octave**



③ **Band-pass filter (combination of low-pass filter and high-pass filter for mid): 6 dB/octave**

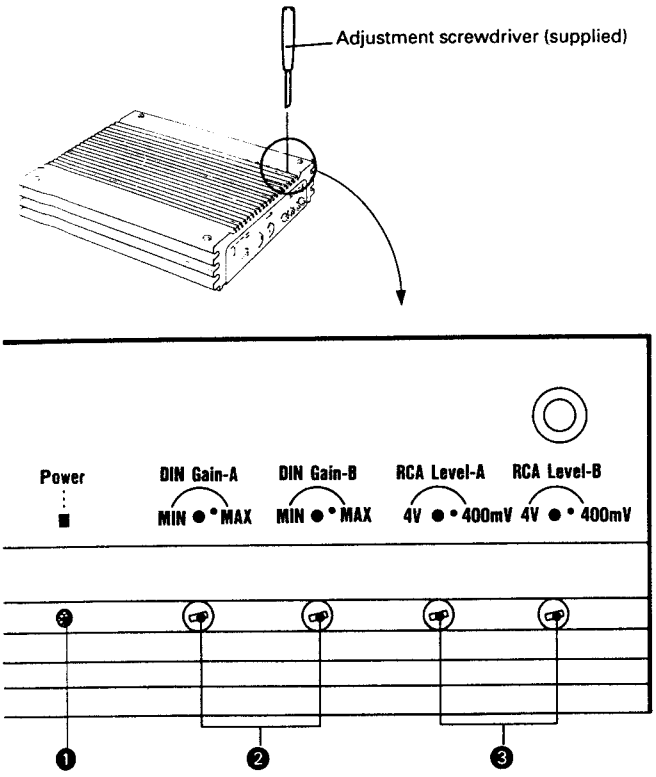


Component Guide

Speaker load impedance	2Ω		4Ω		8Ω	
fc (Hz)	L (mH)	C (μF)	L (mH)	C (μF)	L (mH)	C (μF)
50	6.4	1600	12.7	800	25.5	400
80	4.0	1000	8.0	500	16	250
125	2.5	560	5.1	300	10	160
200	1.6	400	3.2	200	6.4	100
320	1.0	250	2.0	125	4	62
500	0.64	160	1.3	80	2.6	40
800	0.4	100	0.8	50	1.6	25
1250	0.25	64	0.5	30	1.0	16
2000	0.16	40	0.3	20	0.64	10
3200	0.1	25	0.2	12.5	0.4	6.2
5000	0.06	16	0.13	8	0.26	4
8000	0.04	10	0.08	5	0.16	2.5
10000	0.03	8	0.06	4	0.13	2

- A multi-channel system can be set up using a combination of filters ①, ②, and ③. The inductance (L) and capacitance (C) that determine the frequency (fc) applicable to the system should be chosen according to the above table .
- **Use the capacitors specified. Non-polarized capacitors rated at over ±25V should be used for C1 and C2 in the diagram.**

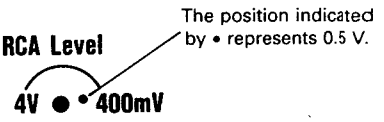
4. CONTROLS AND THEIR USE (EW MODEL)



❶ Power indicator
The power indicator lights when the power is switched on.

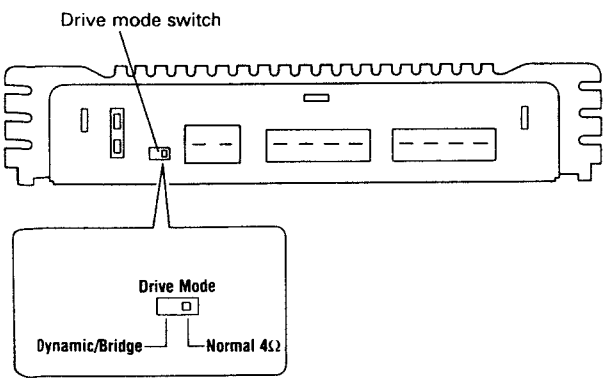
❷ DIN input gain controls A and B
If the amplifier is connected to a Pioneer car component with a DIN socket, DIN input gain controls A and B need to be adjusted. Normally, set the controls to the indicated positions •. Gain control A adjusts speaker output A, gain control B adjusts speaker output B.

❸ RCA input level controls A and B
If the amplifier is connected to a car component with RCA pin jacks, RCA input level controls A and B need to be adjusted. If the component is a Pioneer, set the controls to the indicated positions •. Level control A adjusts speaker output A; level control B adjusts speaker output B.

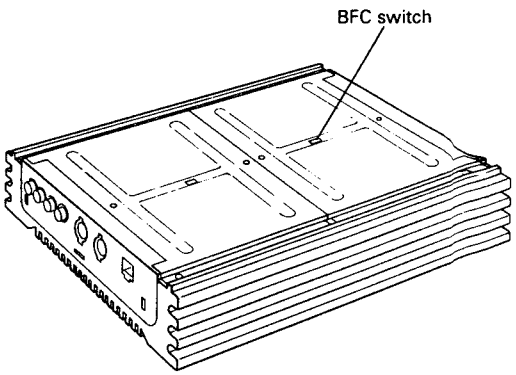


- Adjust controls ❷ and ❸ with the supplied adjustment screwdriver. Keep the screwdriver in case you need to readjust the controls later.

Drive mode switch
If the impedance of the speakers connected to the amplifier in 4-channel mode is 4Ω or more, slide the drive mode switch on the front to the right (Normal 4Ω). If 2- or 3-channel mode is used or if the speaker impedance is less than 4Ω, slide the switch to the left (Dynamic/Bridge).



BFC (Beat Frequency Control) switch
If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



5. CONNECTING THE UNITS (EW MODEL)

Connect the components as shown in the diagram.

- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

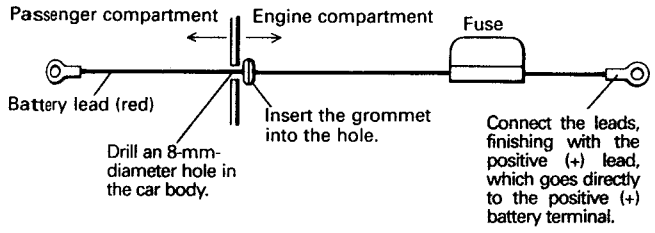
Mode	Speaker ratings
4-channel	Maximum: 80 W Nominal: 40 W
2-channel	Maximum: 180 W Nominal: 90 W
3-channel Speaker output (A)	Maximum: 60 W Nominal: 30 W
Speaker output (B)	Maximum: 180 W Nominal: 90 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown. If a sub-woofer is used, connect the separately-sold crossover network to the amplifier.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the power leads to the amplifier away from the signal cords and speaker leads. Also, keep the power leads away from any antenna cords.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the battery lead and the accessory power lead (red/black) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.
- To connect the amplifier to the RCA pin jacks of a car stereo component, use an audio cord with RCA pin plugs. To connect the amplifier to the DIN socket of a car stereo component, use a DIN connection cord. Both kinds of cord are available from your dealer.

Connecting the battery lead (red)

Route the battery lead (red) from the engine compartment to the passenger compartment to connect it to the amplifier. To prevent a short circuit, do not connect the positive (+) lead of the battery until the other leads have been connected.


Passenger compartment
Engine compartment
Fuse
Battery lead (red)
Insert the grommet into the hole.
Drill an 8-mm-diameter hole in the car body.
Connect the leads, finishing with the positive (+) lead, which goes directly to the positive (+) battery terminal.

Connection of speaker leads and input leads

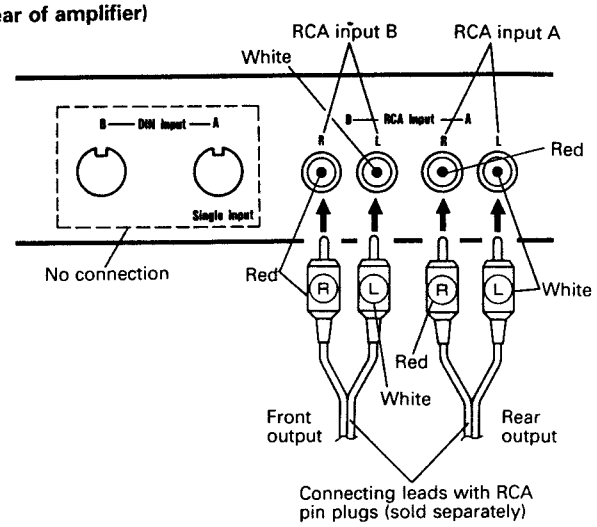
Either 4-channel mode (2 inputs/4 speakers or 1 input/4 speakers), 2-channel mode (1 input/2 speakers), or 3-channel mode (2 inputs/3 speakers) can be selected for the speaker output. The way the speaker leads and RCA or DIN input cords are connected depends on the mode used.

Mode	Input/output	RCA pin jacks are used (*1)	DIN socket is used (*2)
4-channel mode, type 1	• Inputs A and B (2 inputs) • 4-speaker (front/rear) output	Page 11	Page 13
4-channel mode, type 2	• Input A (1 input) • 4-speaker (2 stereo pairs) output	Page 11	Page 13
2-channel mode	• Input A (1 input) • 2-speaker output	Page 12	Page 14
3-channel mode	• Inputs A and B (2 inputs) • 2-speaker (stereo) plus 1 speaker (mono) output	Page 12	Page 14

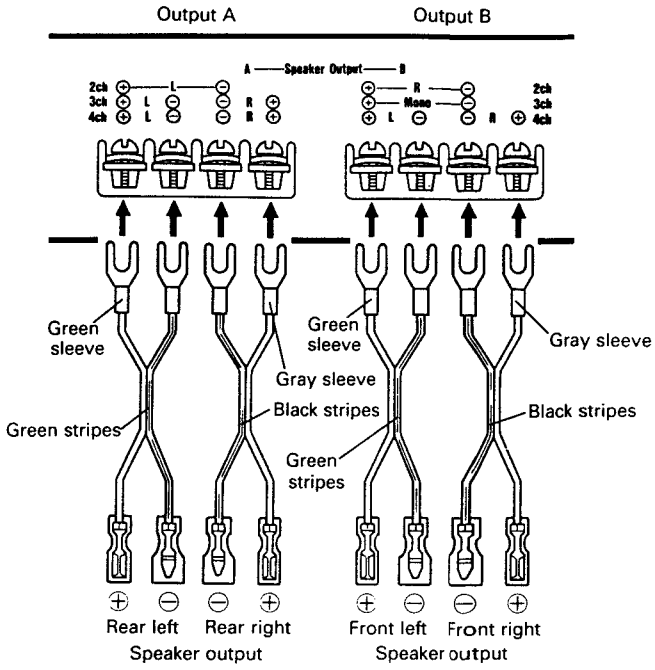
Connection of speaker and RCA input leads when the amplifier is connected to a car component with RCA pin jacks

When using 4-channel mode type 1

(Rear of amplifier)



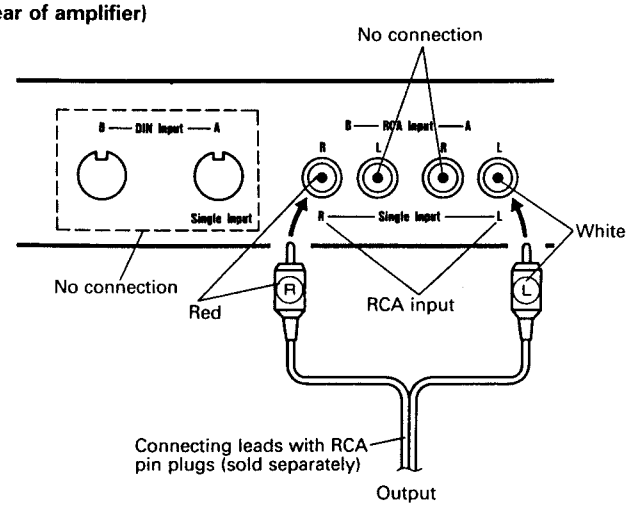
(Front of amplifier)



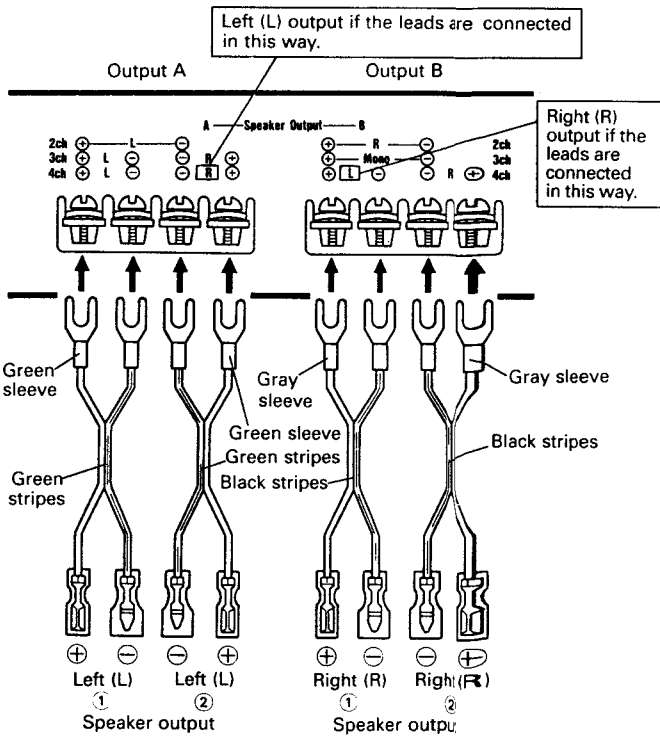
When using 4-channel mode type 2

- With this connection, the left (L) and right (R) positions of the speaker terminals on the front of the amplifier are slightly different from the positions indicated.
- The left (L) ① and right (R) ① speaker leads to stereo output ① and the left (L) ② and right (R) ② speaker leads to stereo output ② (two pairs of stereo outputs).
- Connect the RCA outputs of the car component to the RCA inputs marked Single Input on the rear of the amplifier.
- If the RCA input levels are adjusted, set input level controls A and B to the same position.

(Rear of amplifier)



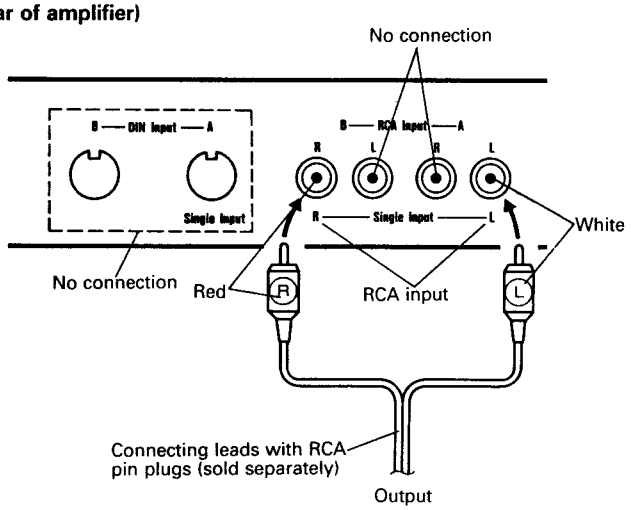
(Front of amplifier)



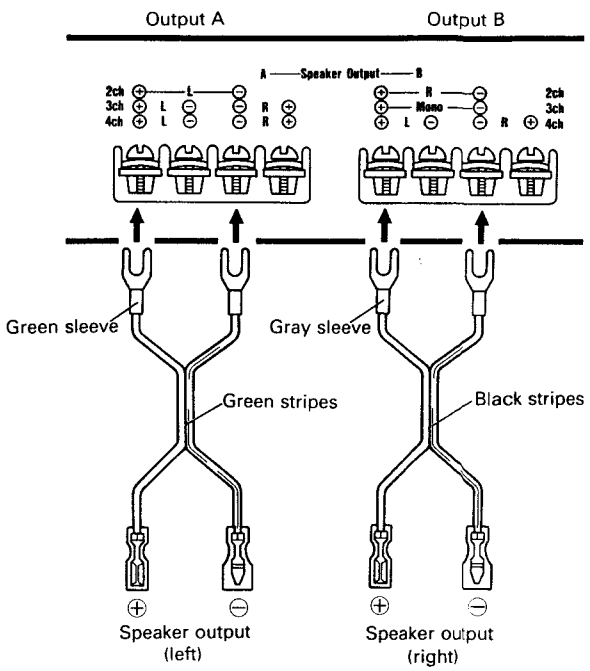
When using 2-channel mode

- Connect the RCA outputs of the car component to the RCA inputs marked Single Input on the rear of the amplifier.
- Slide the drive mode switch to the left (Dynamic/Bridge).
- If the RCA input levels are adjusted, set input level controls A and B to the same position.

(Rear of amplifier)



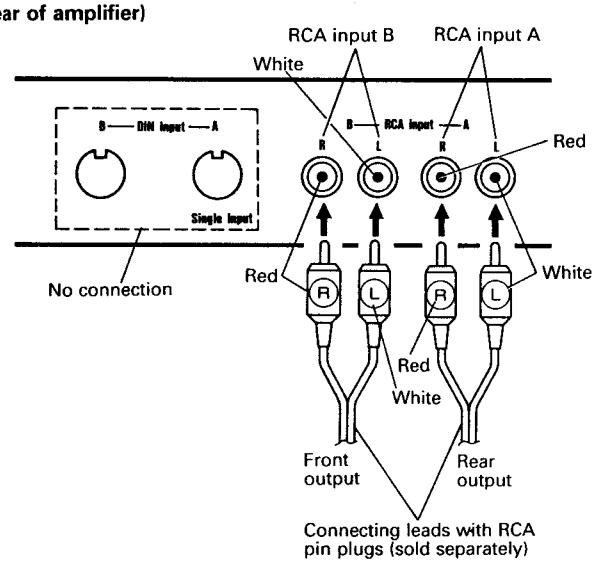
(Front of amplifier)



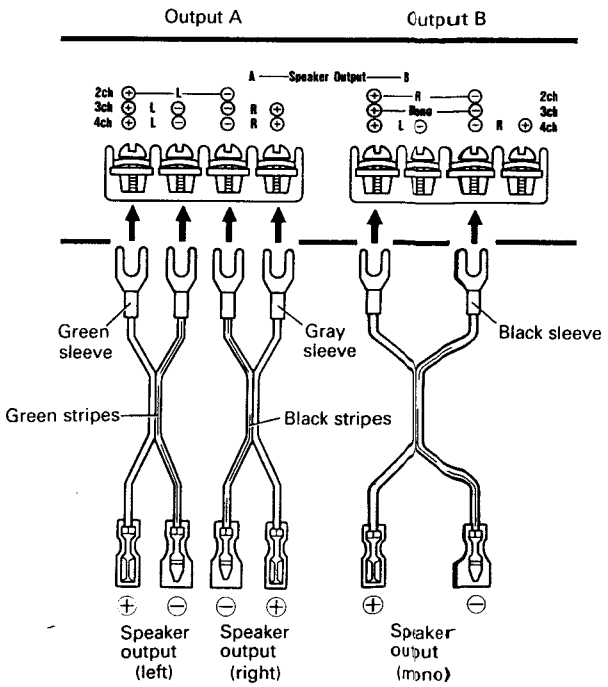
When using 3-channel mode

- Slide the drive mode switch to the left (Dynamic/Bridge).

(Rear of amplifier)



(Front of amplifier)

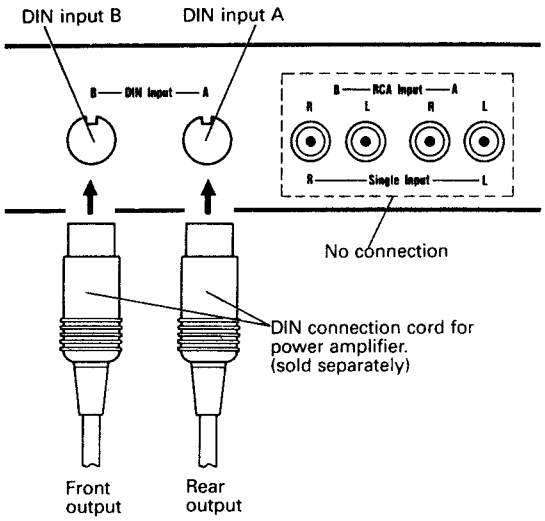


Connection of speaker leads and DIN input cords when the amplifier is connected to a Pioneer car component with a DIN socket

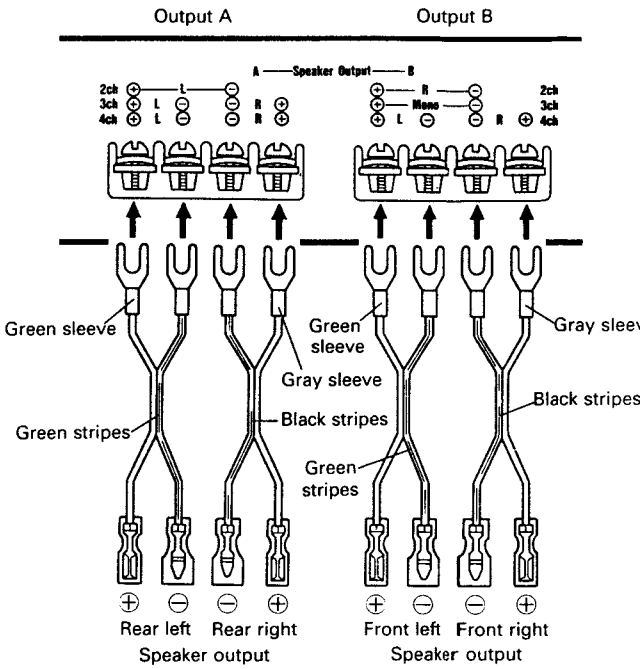
When using 4-channel mode type 1

- Connect the rear DIN output of the car component to DIN input A of the amplifier. The amplifier does not work if the front DIN output of the car component is connected to DIN input A.

(Rear of amplifier)


DIN input B
DIN input A
B — DIN Input — A
B — RCA Input — A
R L R L
R — Single Input — L
No connection
DIN connection cord for power amplifier. (sold separately)
Front output
Rear output

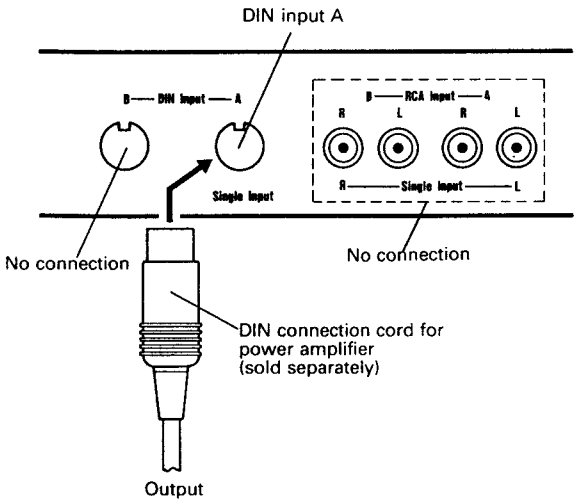
(Front of amplifier)



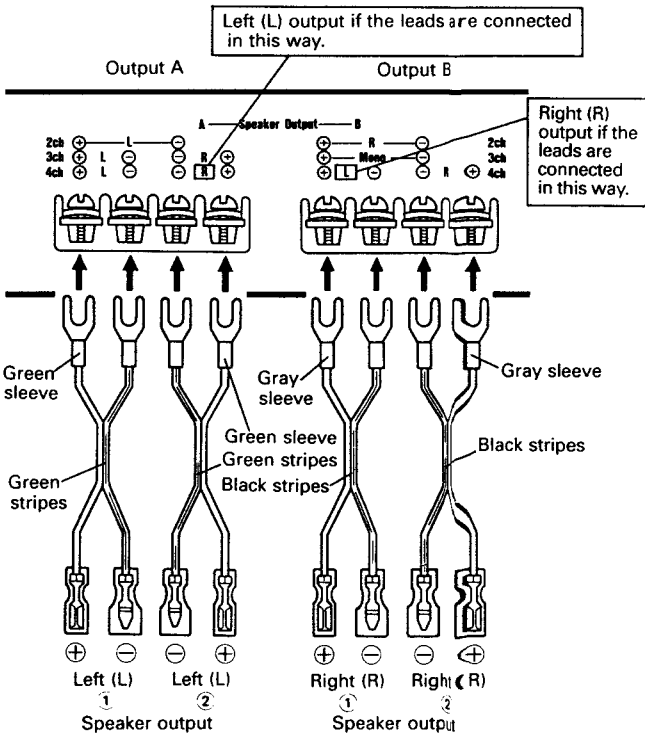
When using 4-channel mode type 2

- With this connection, the left (L) and right (R) positions of the speaker terminals on the front of the amplifier are slightly different from the positions indicated.
- The left (L) ① and right (R) ① speaker leads to stereo output ①, and the left (L) ② and right (R) ② speaker leads to stereo output ② (two sets of stereo outputs).
- Connect the DIN output of the car component to DIN input A on the rear of the amplifier.
- If the DIN input gains are adjusted, set DIN input gain controls A and B to the same position.

(Rear of amplifier)


DIN input A
B — DIN Input — A
B — RCA Input — A
R L R L
Single Input
R — Single Input — L
No connection
No connection
DIN connection cord for power amplifier (sold separately)
Output

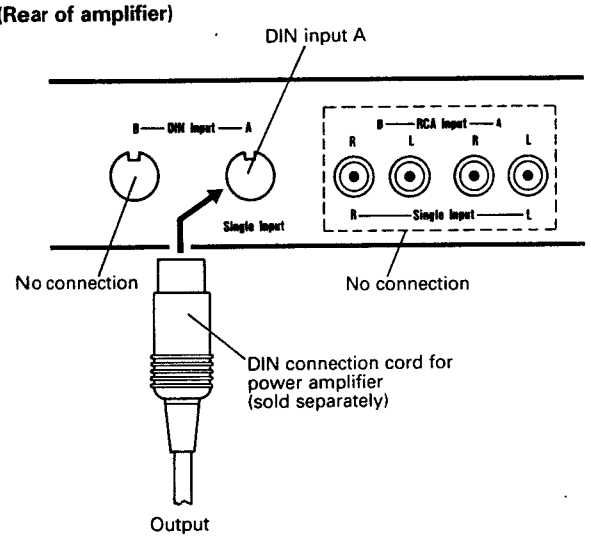
(Front of amplifier)



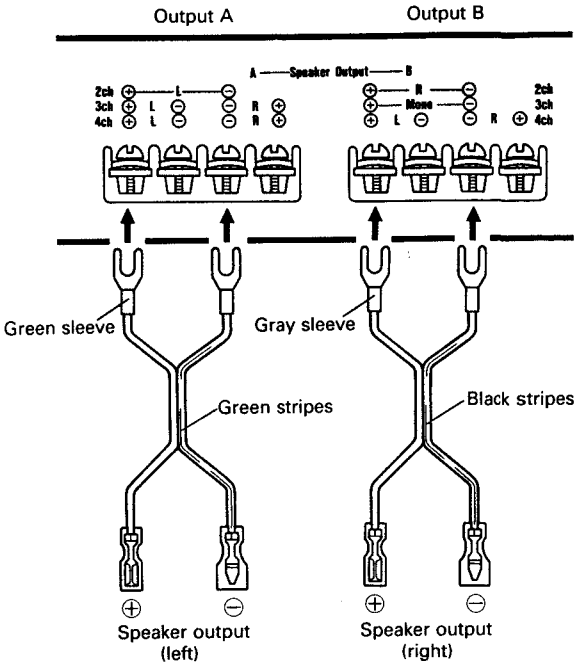
When using 2-channel mode

- Connect the DIN output of the car component to DIN input A on the rear of the amplifier.
- Slide the drive mode switch to the left (Dynamic/Bridge).
- If the DIN input gains are adjusted, set DIN input gain controls A and B to the same position.

(Rear of amplifier)


DIN input A
B — DIN Input — A
B — RCA Input — A
R L R L
R — Single Input — L
Single Input
No connection
No connection
DIN connection cord for power amplifier (sold separately)
Output

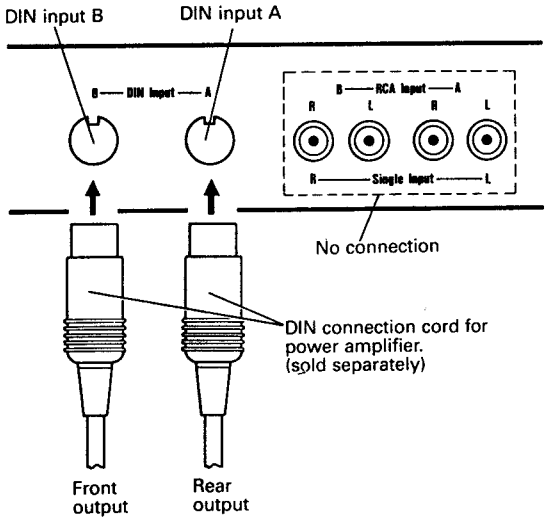
(Front of amplifier)



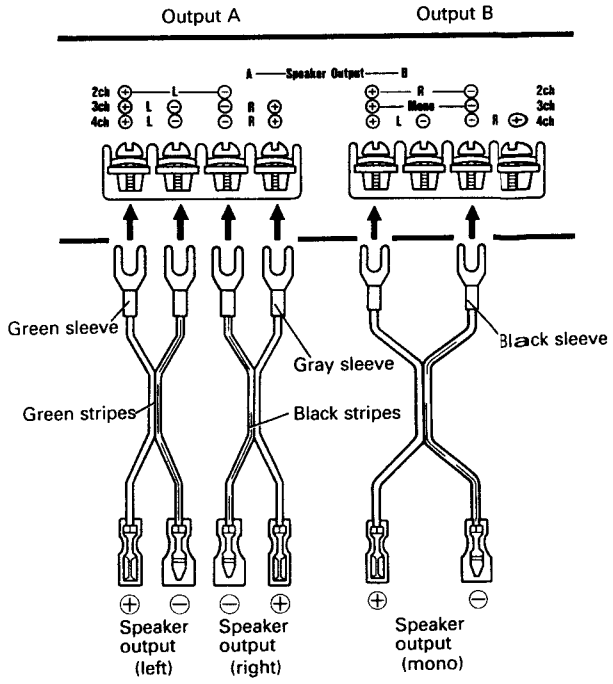
When using 3-channel mode

- Connect the rear DIN output of the car component to DIN input A on the rear of the amplifier. The amplifier does not work if the front DIN output of the car component is connected to DIN input A.
- Connect the front DIN output of the car component to DIN input B on the rear of the amplifier (mono output).
- Slide the drive mode switch to the left (Dynamic/Bridge).

(Rear of amplifier)

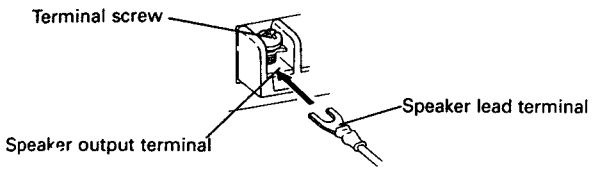

DIN input B
DIN input A
B — DIN Input — A
B — RCA Input — A
R L R L
R — Single Input — L
No connection
DIN connection cord for power amplifier. (sold separately)
Front output
Rear output

(Front of amplifier)

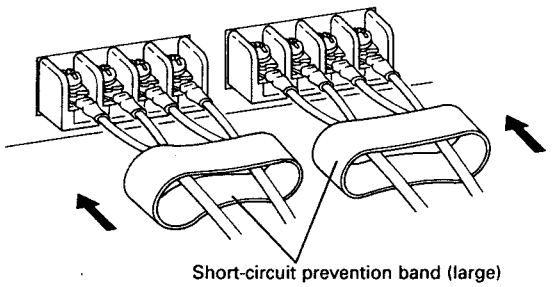


Speaker lead connection procedure

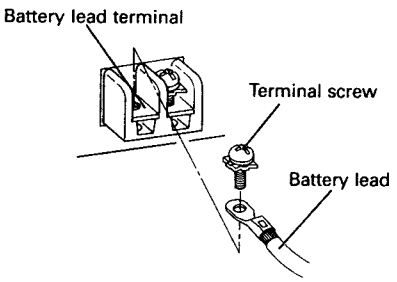
1. Loosen the eight screws of the speaker terminals (Speaker Outputs A and B) on the front of the amplifier.
2. Insert the end of each speaker lead between the speaker terminal and its screw according to the mode to be used, and tighten the screw.



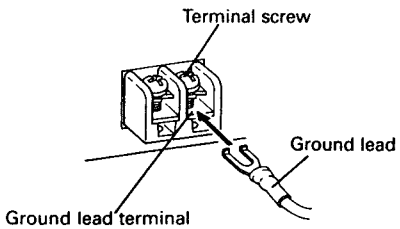
3. Cover each terminal block with a short-circuit prevention band (large).
   - This band *must* be used.



3. Connect the battery lead to the battery lead terminal, reinserting and tightening the screw.

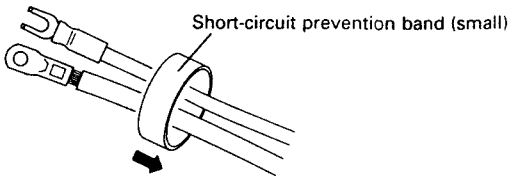


4. Connect the ground lead to the ground lead terminal, tightening the screw.

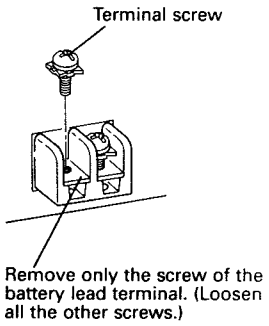


Connection of the battery power and ground leads

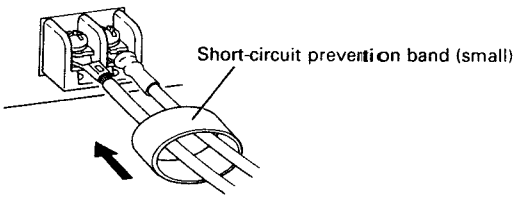
1. Pass the battery power and ground leads through a short-circuit prevention band (small).
   - This band *must* be used.



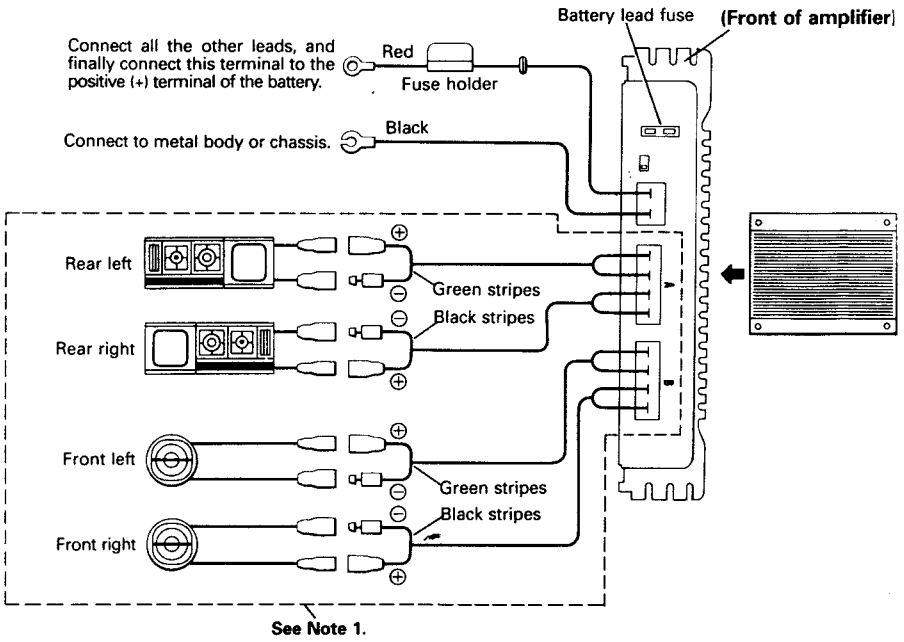
2. Loosen the screws of the terminals on the front of the amplifier.
   - Remove the screw from the battery power terminal.



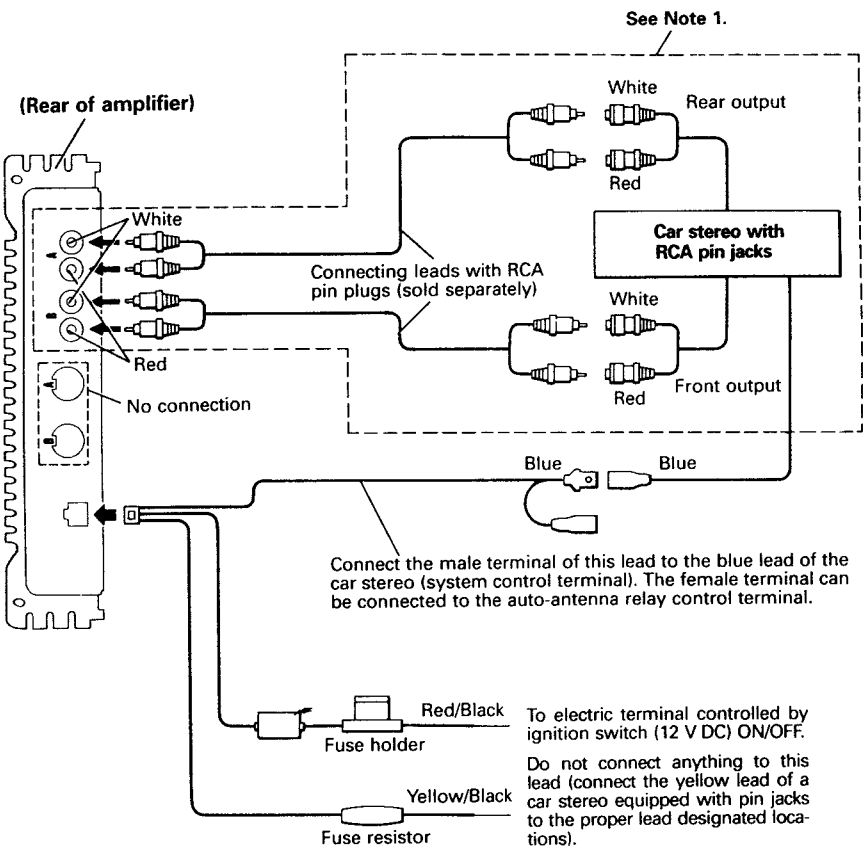
5. Cover the terminals with a short-circuit prevention band (small).



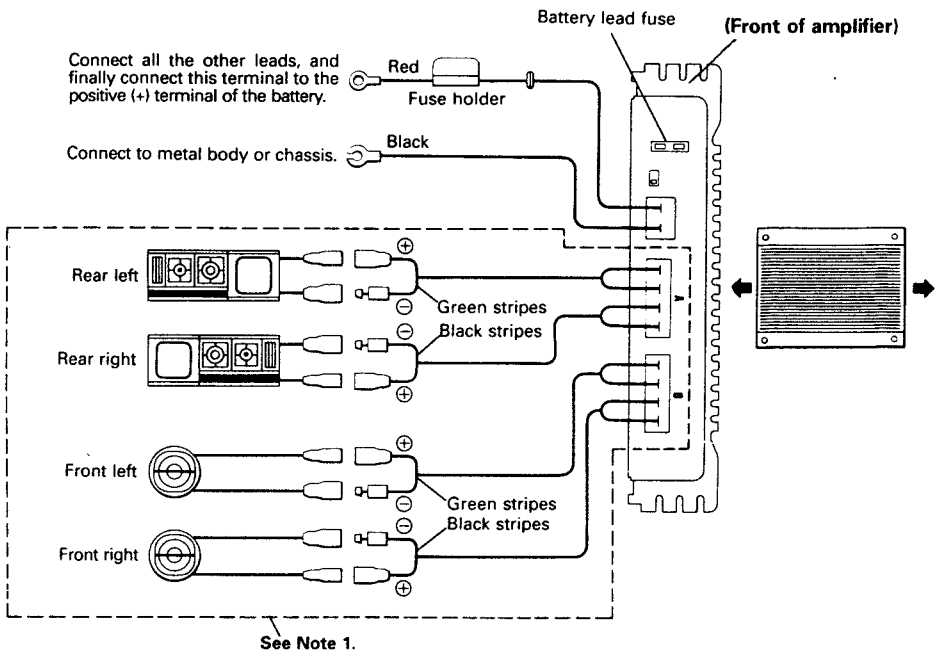
When Combined with a Car Stereo with RCA Pin Jacks



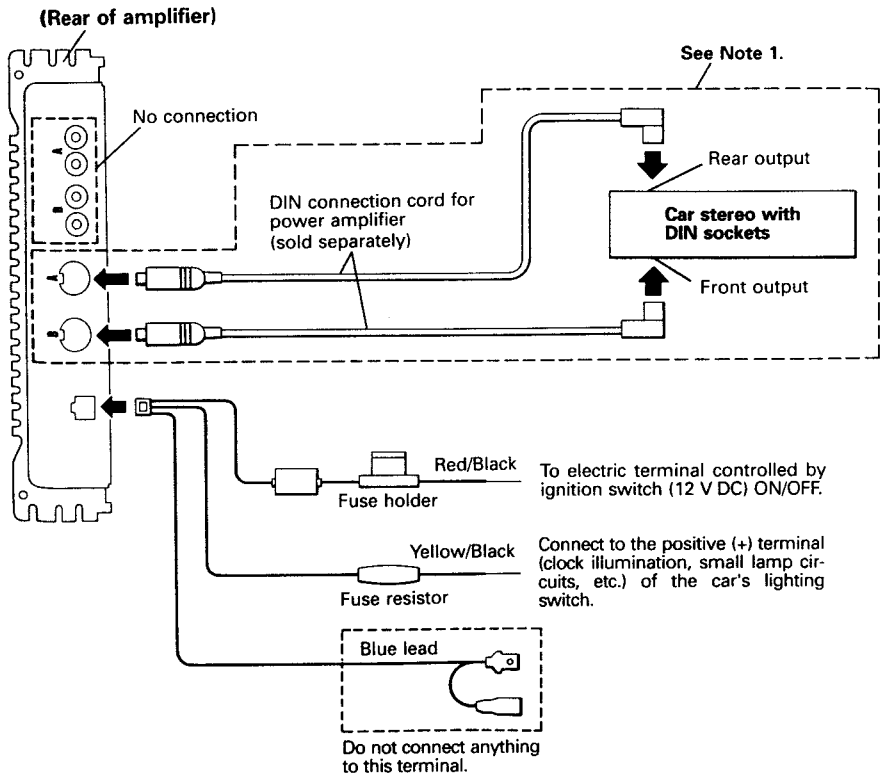
Note 1:
The connection method for the speaker and RCA leads differs according to the mode (4-channel, 3-channel, or 2-channel). [This connection diagram is for the 4-channel mode (2 inputs/4 speakers).]


See Note 1.
(Rear of amplifier)
White
Rear output
Red
White
Red
No connection
Car stereo with RCA pin jacks
Connecting leads with RCA pin plugs (sold separately)
White
Red
Front output
Blue
Blue
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
Red/Black
Fuse holder
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Do not connect anything to this lead (connect the yellow lead of a car stereo equipped with pin jacks to the proper lead designated locations).
Yellow/Black
Fuse resistor

When Combined with a Car Stereo with DIN Sockets



Note 1:
The connection method for the speaker leads and DIN cords differs according to the mode (4-channel, 3-channel, or 2-channel). [This connection diagram is for the 4-channel mode (2 inputs/4 speakers).]


(Rear of amplifier)
See Note 1.
No connection
DIN connection cord for power amplifier (sold separately)
Rear output
Car stereo with DIN sockets
Front output
Red/Black
Fuse holder
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Yellow/Black
Fuse resistor
Connect to the positive (+) terminal (clock illumination, small lamp circuits, etc.) of the car's lighting switch.
Blue lead
Do not connect anything to this terminal.

6. DISASSEMBLY

• Remove the Case

1. Remove the four screws A and remove the two cases.

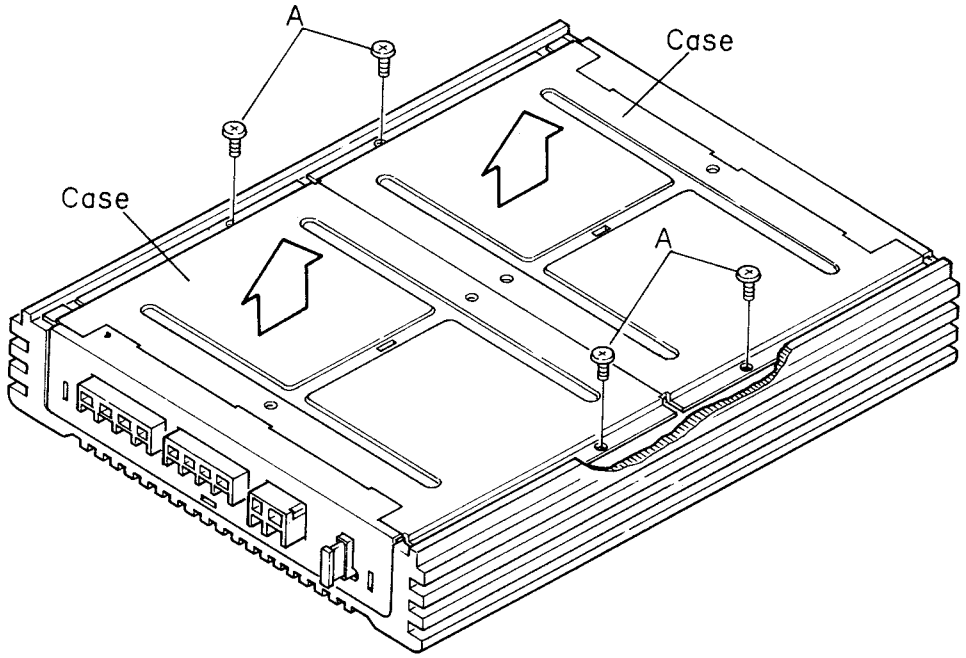


Fig. 1

• Remove the Amp Assy

1. Remove the two screws B and remove the front panel.
2. Remove the two screws C and remove the rear panel.
3. Remove the four screws D and eleven screws E.
4. Remove the Amp Assy.

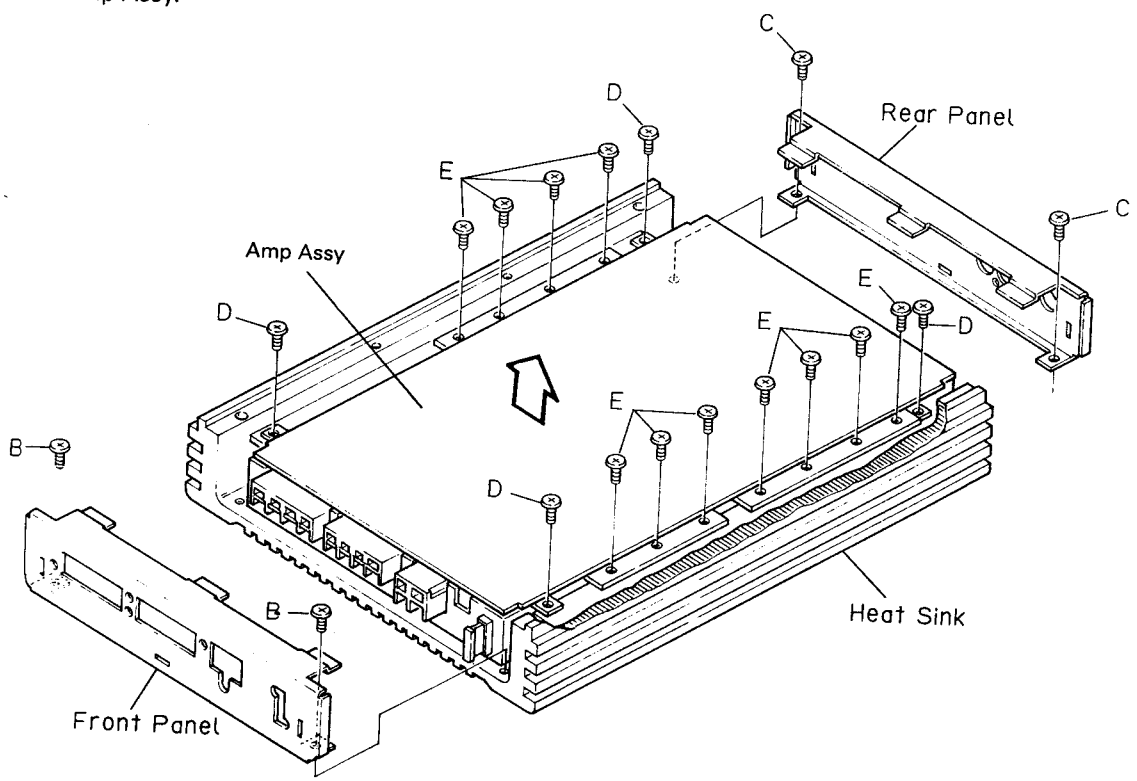


Fig. 2

7. CIRCUIT DESCRIPTION

● PWM (Pulse Width Modulation) POWER SUPPLY

The PWM power supply is a circuit that maintains stable secondary voltage in a DC-DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.
Former PWM power supply detected and controlled only positive voltage of DC-DC converter. New PWM power supply increases output in the lower range through detecting and controlling both positive and negative voltages and it creates a higher fidelity sound.

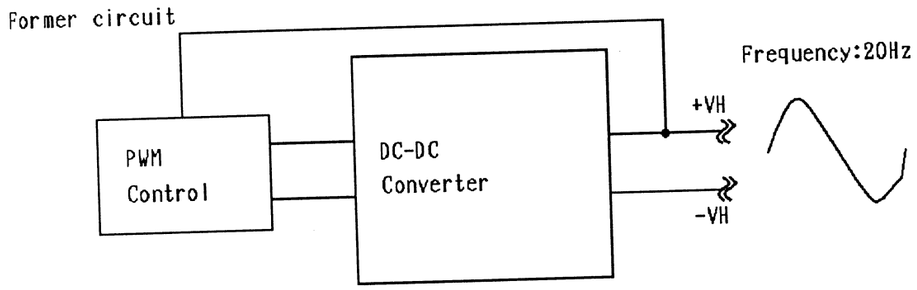


Fig. 3

Former circuit did not detect negative voltage and it created distortions at the lower part as output increases.

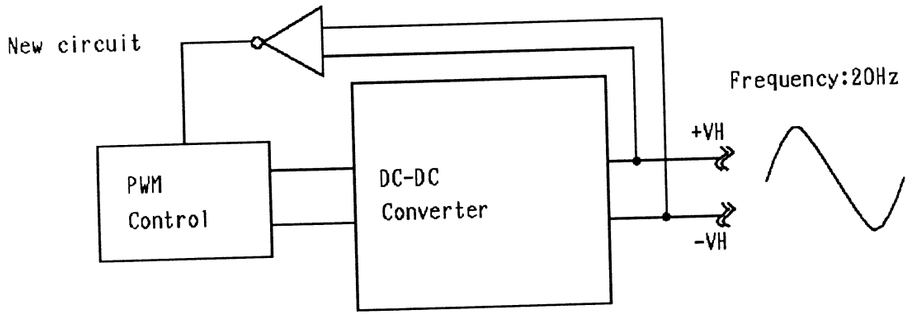


Fig. 4

New circuit detects both positive and negative voltage and it dose not create any distortions at the lower part even when output increases.

8. ADJUSTMENT

● Connection Diagram

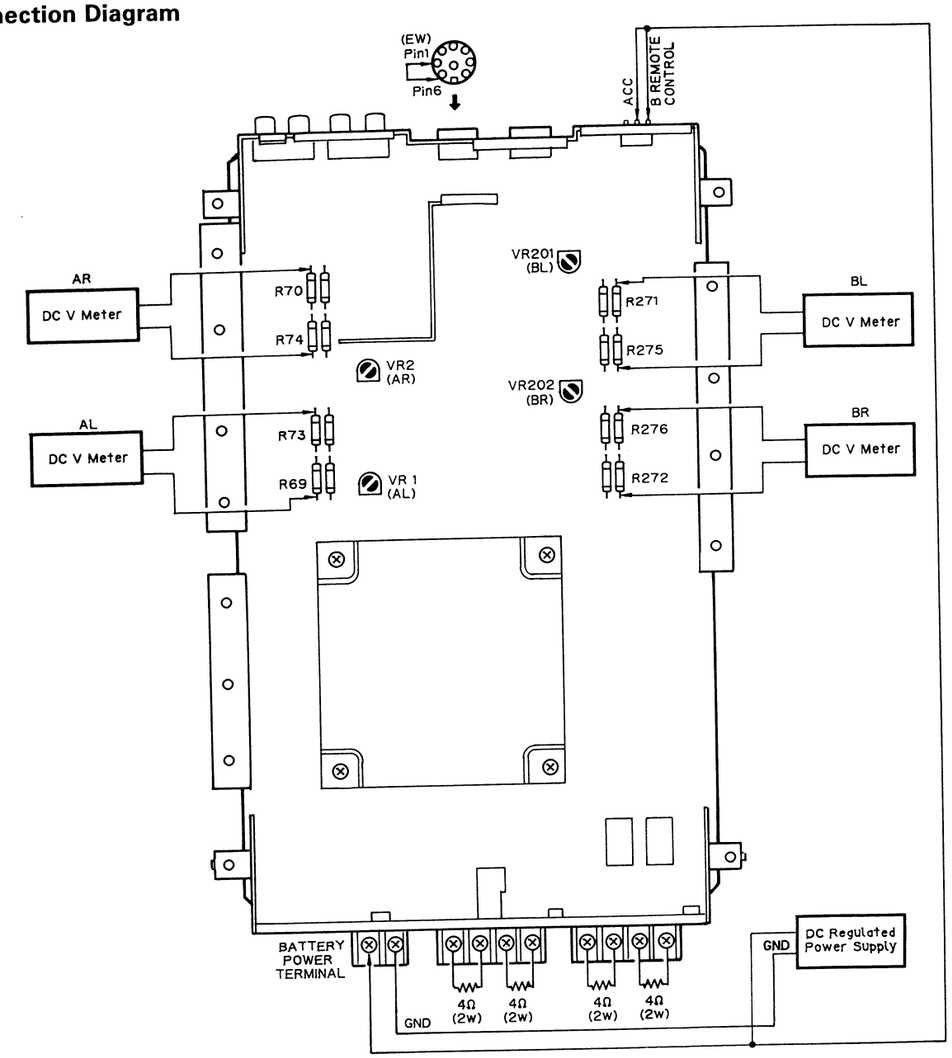


Fig. 5

8.1 IDLE CURRENT ADJUSTMENT

No.	Adjusting Point	Adjustment Method (Switch Position)
1		Rotate VR1, VR2, VR201 and VR202 counterclockwise. Turn the power on, and wait about 10 minutes.
2	VR1 (AL) VR2 (AR) VR201 (BL) VR202 (BR)	DC V Meter: 1.0mV+ 2.3mV - 0.34mV (DRIVE MODE SELECT SWITCH : 4Ω ·····GM-3400/EW)

8. ADJUSTMENT

● Connection Diagram

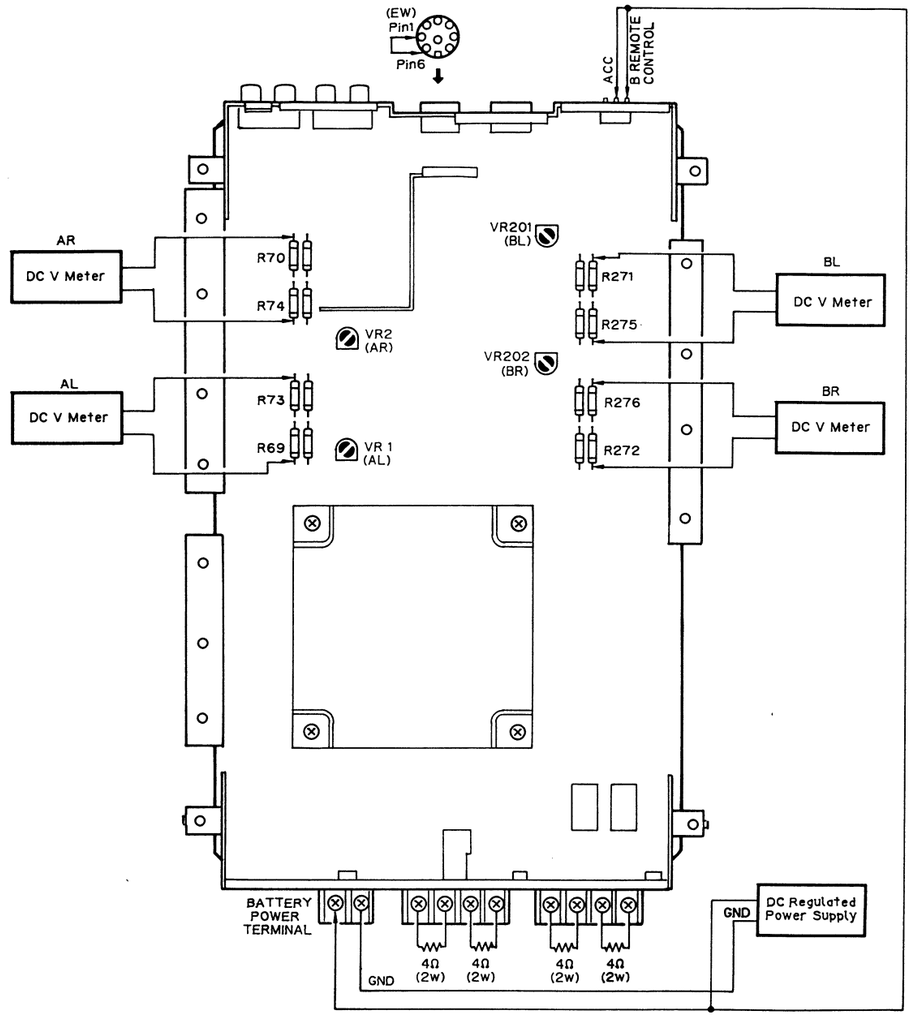


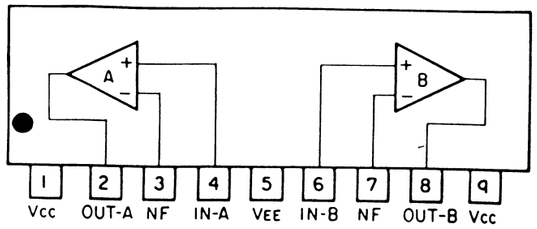
Fig. 5

8.1 IDLE CURRENT ADJUSTMENT

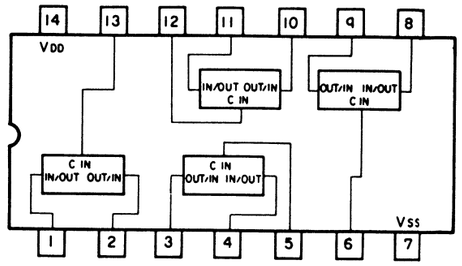
No.	Adjusting Point	Adjustment Method (Switch Position)
1		Rotate VR1, VR2, VR201 and VR202 counterclockwise. Turn the power on, and wait about 10 minutes.
2	VR1 (AL) VR2 (AR) VR201 (BL) VR202 (BR)	DC V Meter: 1.0mV+ 2.3mV - 0.34mV (DRIVE MODE SELECT SWITCH : 4Ω ·····GM-3400/EW)

● ICs

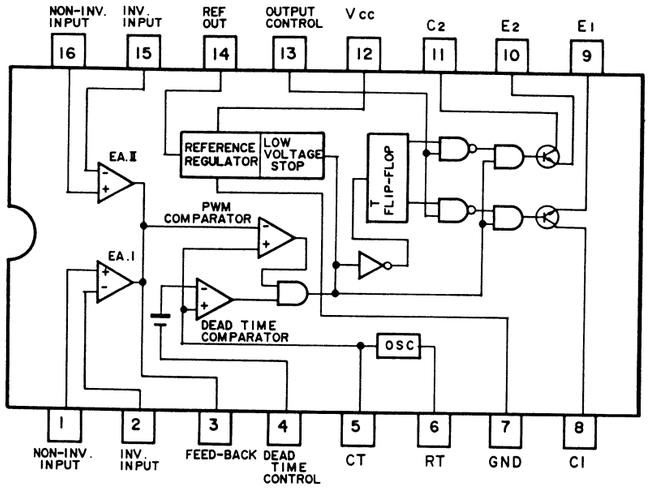
UPC4570HA



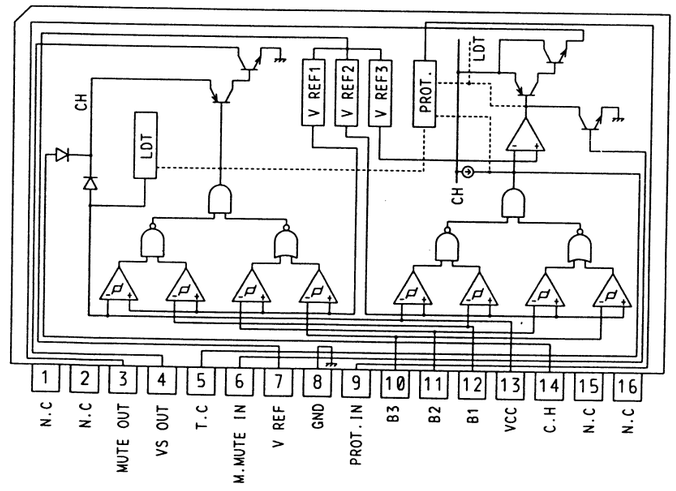
TC4066BP



UPC494C

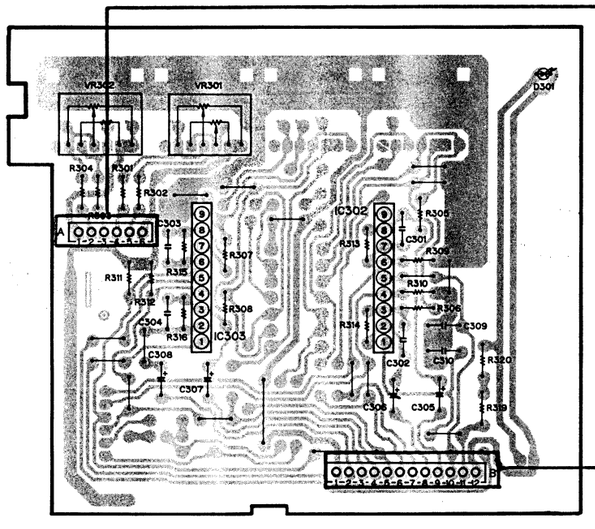


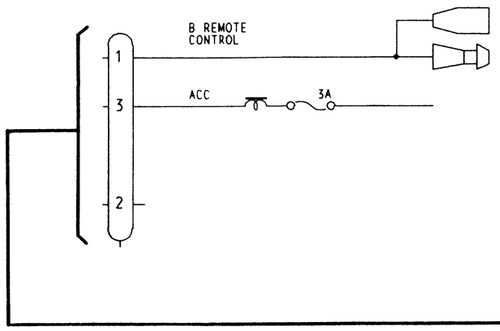
TA8194Z



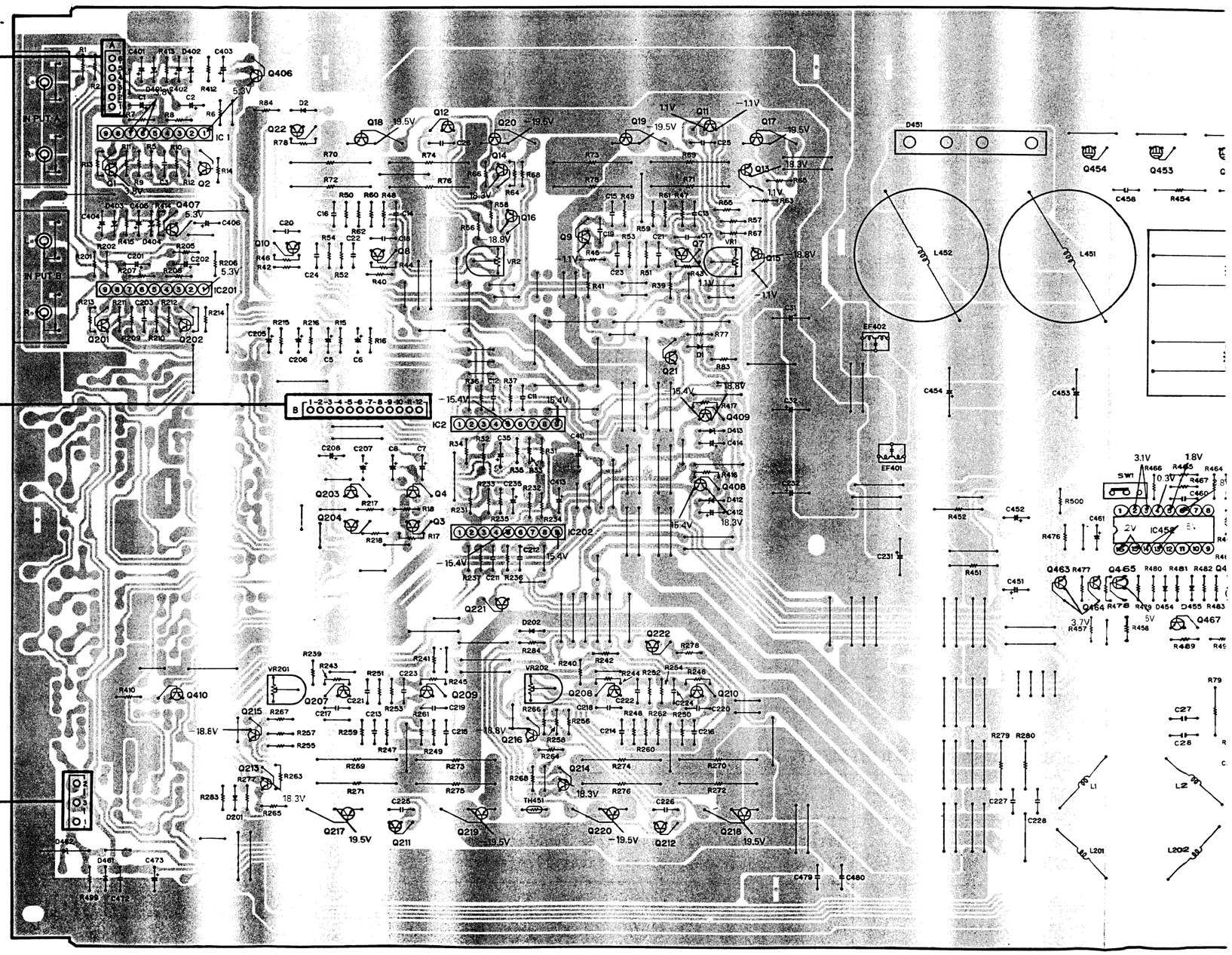
9. CONNECTION DIAGRAM (GM-H120/UC)

VOLUME UNIT



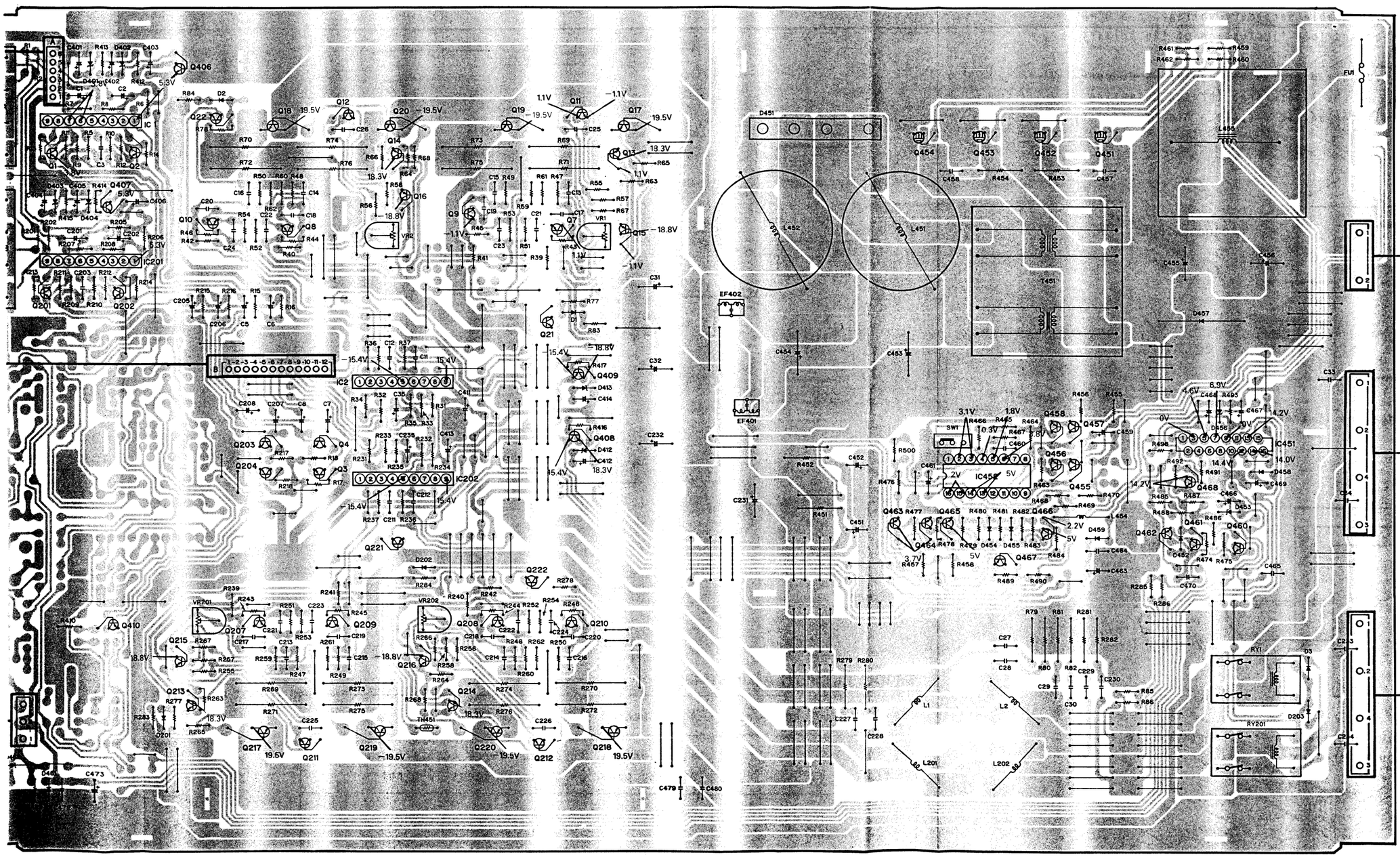


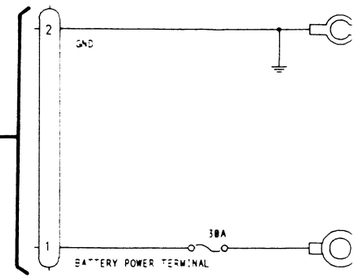
AMP UNIT



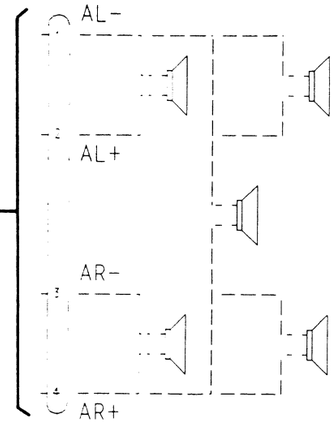
UNIT

Q1 Q201 IC 1 IC201 Q407 Q410 Q2 Q202 Q406 Q10 Q215 Q22 Q213 Q207 Q217 Q18 Q203 Q204 Q8 Q4 Q3 Q211 Q12 Q209 Q219 Q20 IC2 IC202 Q221 Q14 Q16 Q216 Q9 Q214 Q19 Q208 Q220 Q7 Q21 Q222 Q212 Q11 Q409 Q408 Q210 Q17 Q13 Q15 Q218 VR201 VR2 VR202 VR1 Q454 Q463 Q464 Q465 Q453 IC452 Q467 Q452 Q458 Q456 Q466 Q457 Q455 Q451 Q462 Q468 Q461 IC451 Q460





4ch 2ch 3c



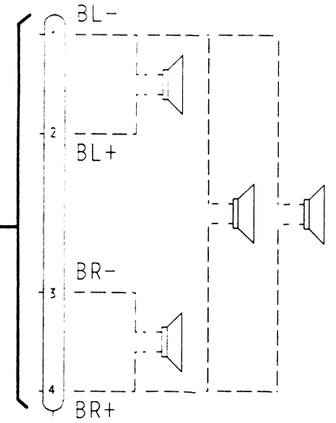
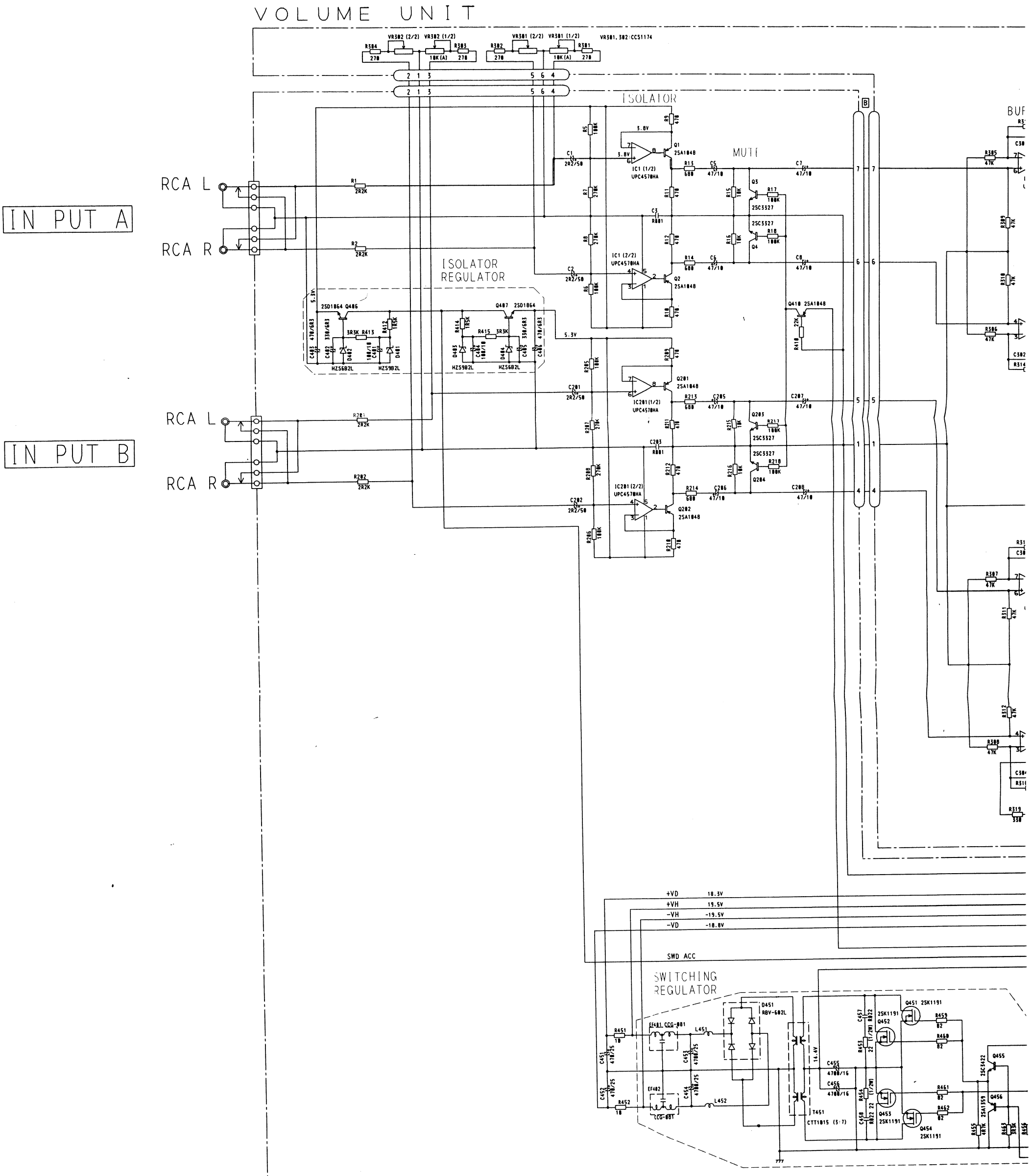


Fig.

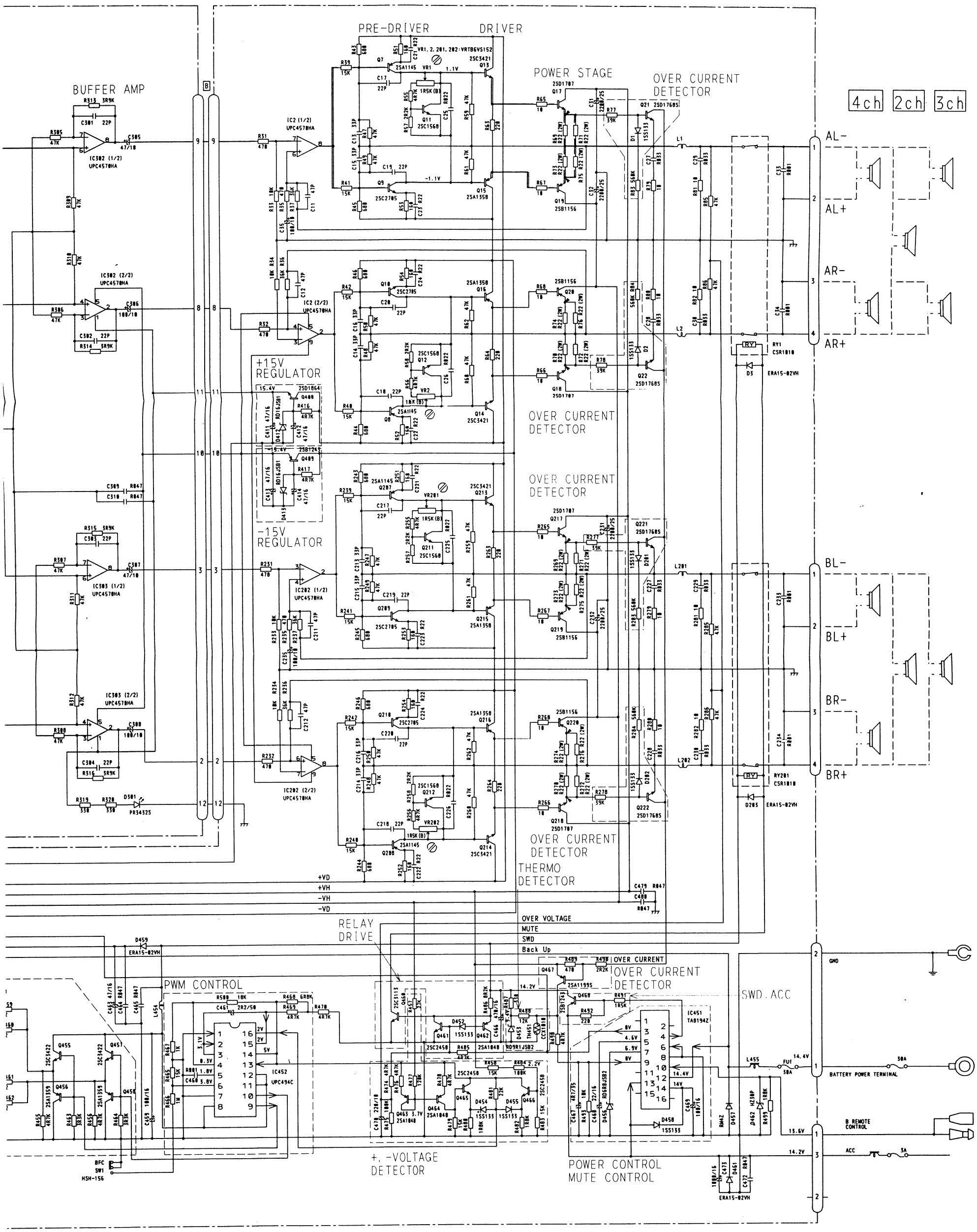
10. SCHEMATIC CIRCUIT DIAGRAM (GM-H120/UC)



NOTE:

- Symbol indicates a resistor. No differentiation is made betwe discrete resistors.
- Symbol indicates a capacitor. No differentiation is made betwe discrete capacitors.

AMP UNIT



s a resistor.
ion is made between chip resistors and
ors.

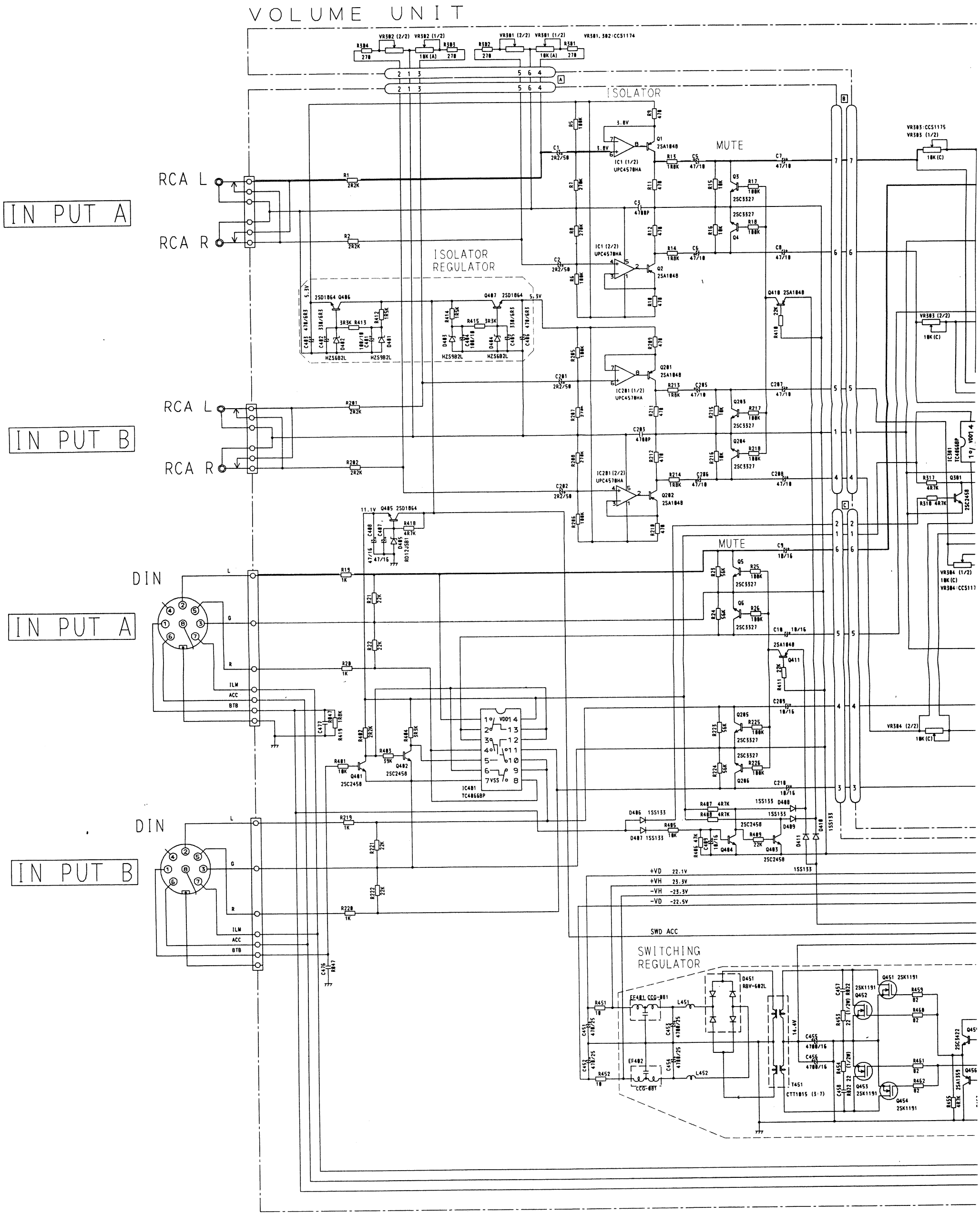
s a capacitor.
ion is made between chip capacitors and
tors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCH:
AMP UNIT
SW1 : BFC SWITCH ..... LOW-HIGH
The underlined indicates the switch position.

Fig. 7

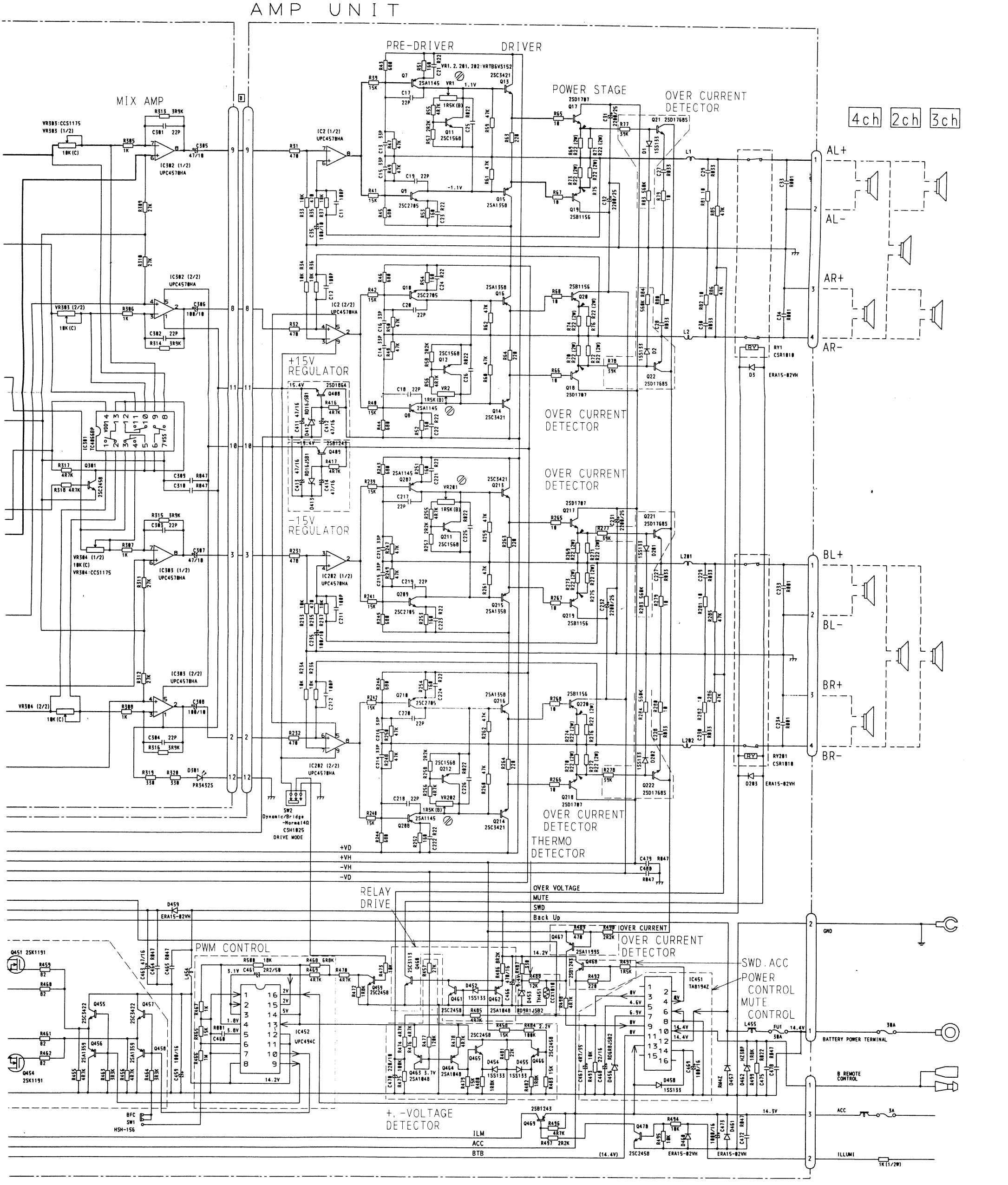
11. SCHEMATIC CIRCUIT DIAGRAM (GM-3400/EW)



NOTE:

- Symbol indicates a resistor. No differentiation is made between discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between discrete capacitors.

AMP UNIT



ndicates a resistor.
entiation is made between chip resistors and resistors.

ndicates a capacitor.
entiation is made between chip capacitors and capacitors.

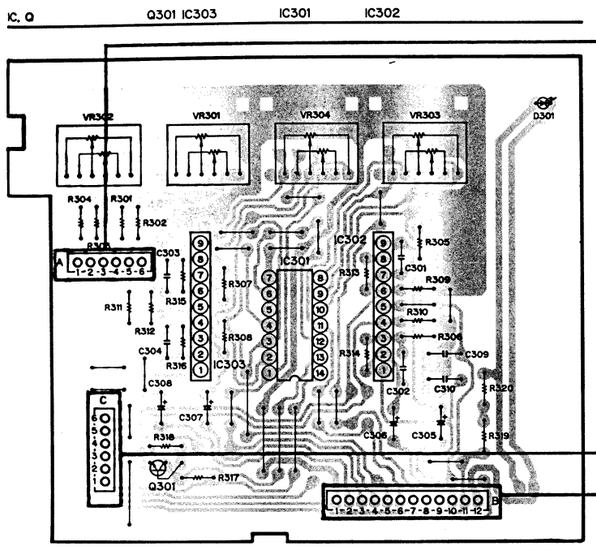
Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022

SWITCHES:
AMP UNIT
SW1 : BFC SWITCH ····· LOW-HIGH
SW2 : DRIVE MODE SWITCH ····· Dynamic/Bridge-Normal4Ω
The underlined indicates the switch position.

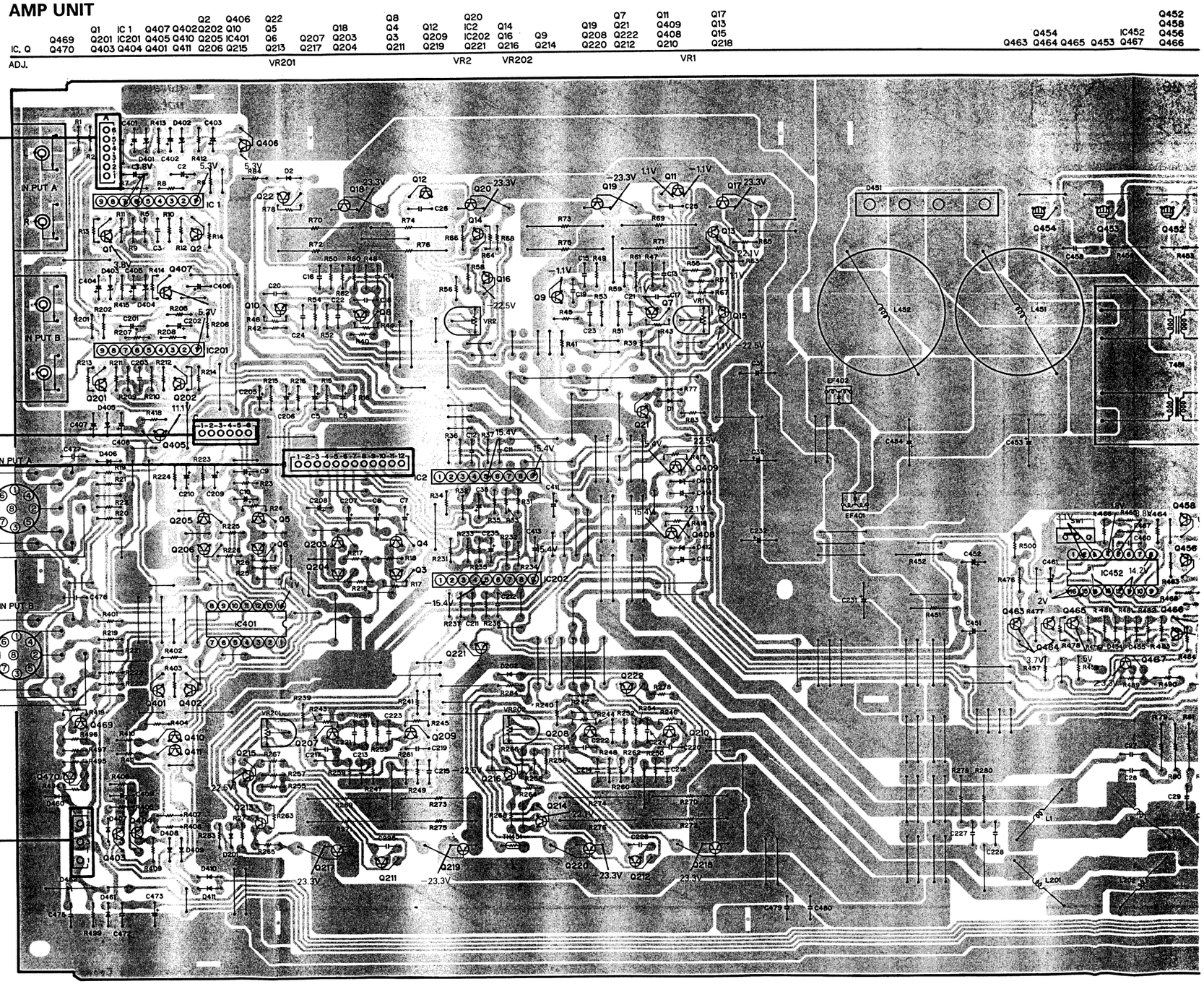
Fig. 8

12. CONNECTION DIAGRAM (GM-3400/EW)

VOLUME UNIT



AMP UNIT



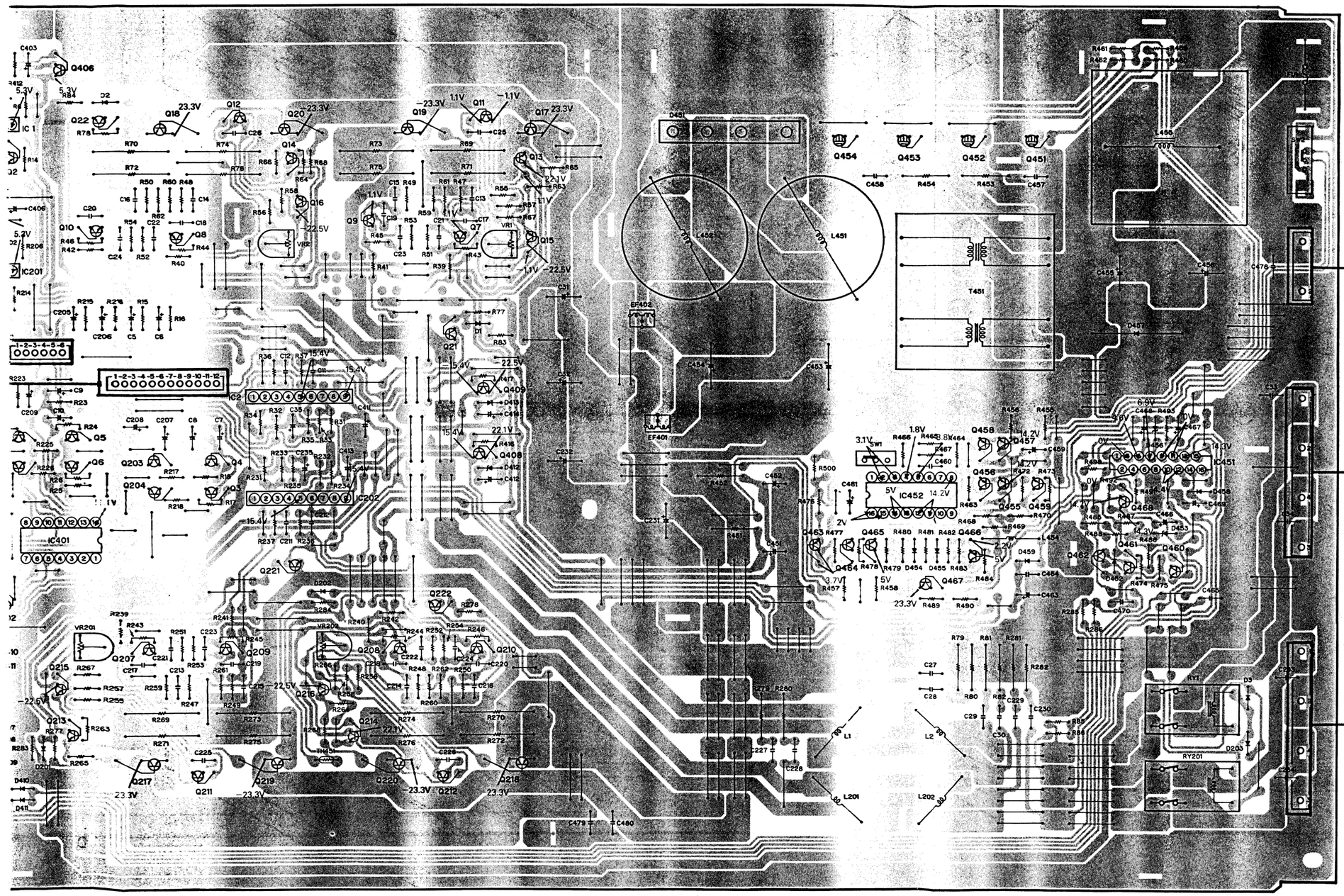

Q2 Q406 Q22
Q202 Q10 Q5
Q205 IC401 Q6 Q207 Q18
Q206 Q215 Q213 Q217 Q203
Q204
Q8
Q4 Q12 Q20
Q3 Q209 IC2 Q14 Q9
Q211 Q219 IC202 Q16 Q214
Q221 Q216
Q19 Q7 Q11 Q17
Q208 Q21 Q409 Q13
Q220 Q212 Q408 Q15
Q210 Q218
Q454
Q463 Q464 Q465 Q453 IC452 Q452
Q467 Q458
Q456 Q457 Q451
Q455 Q459
Q462 Q468 IC451
Q461 Q460
VR201
VR2
VR202
VR1
IC401
IC202
IC452
IC451
T451
L451
L456
L1
L2
L201
L202
SW1
RY201
EF401
EF402
GND
38A
BATTERY POWER TERMINAL
A
4ch 2ch 3ch
B
AL+
AL-
AR+
AR-
C
BL+
BL-
BR+
BR-
D

Fig. 9

13. EXPLODED VIEW

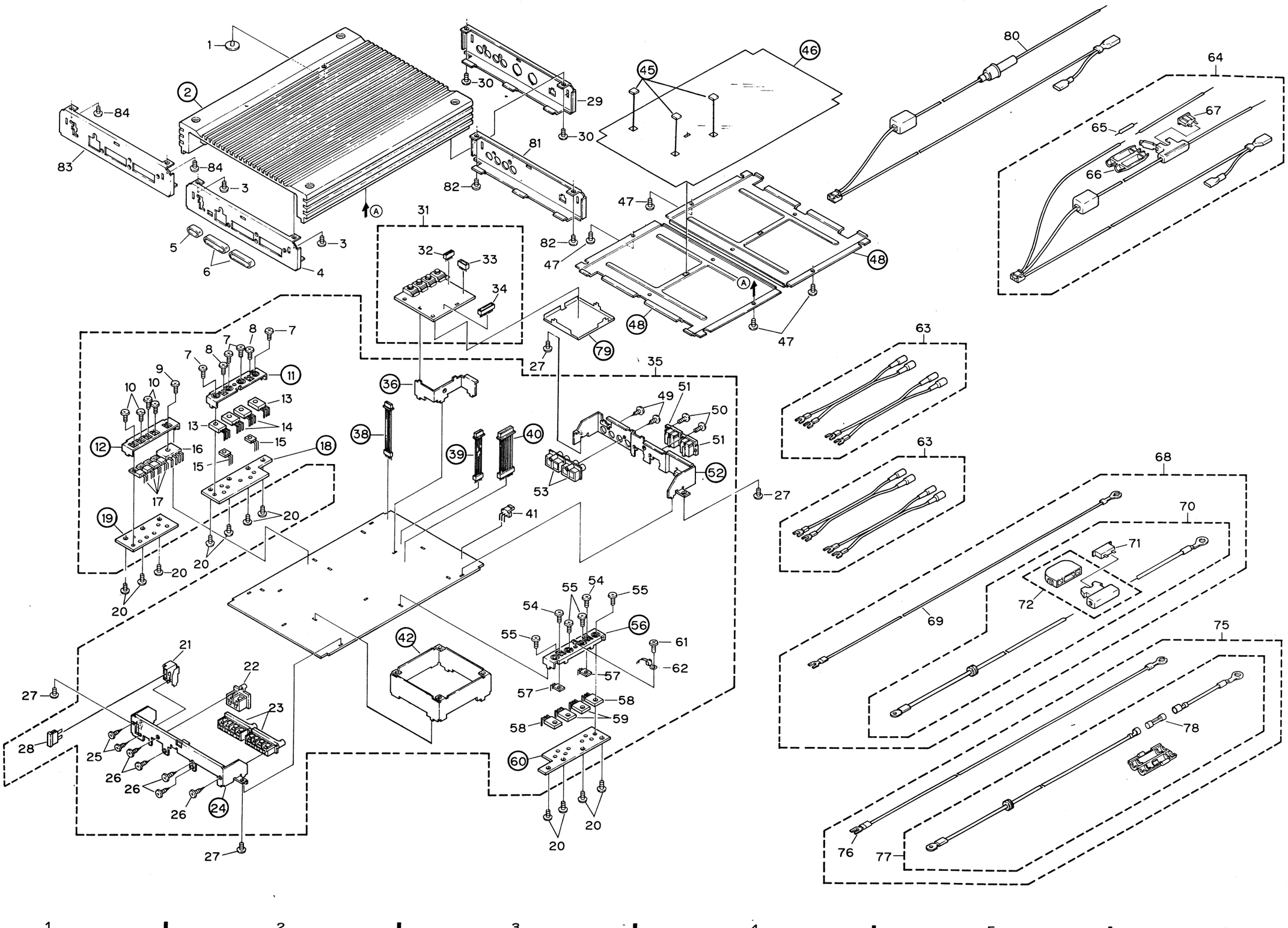


Fig. 10

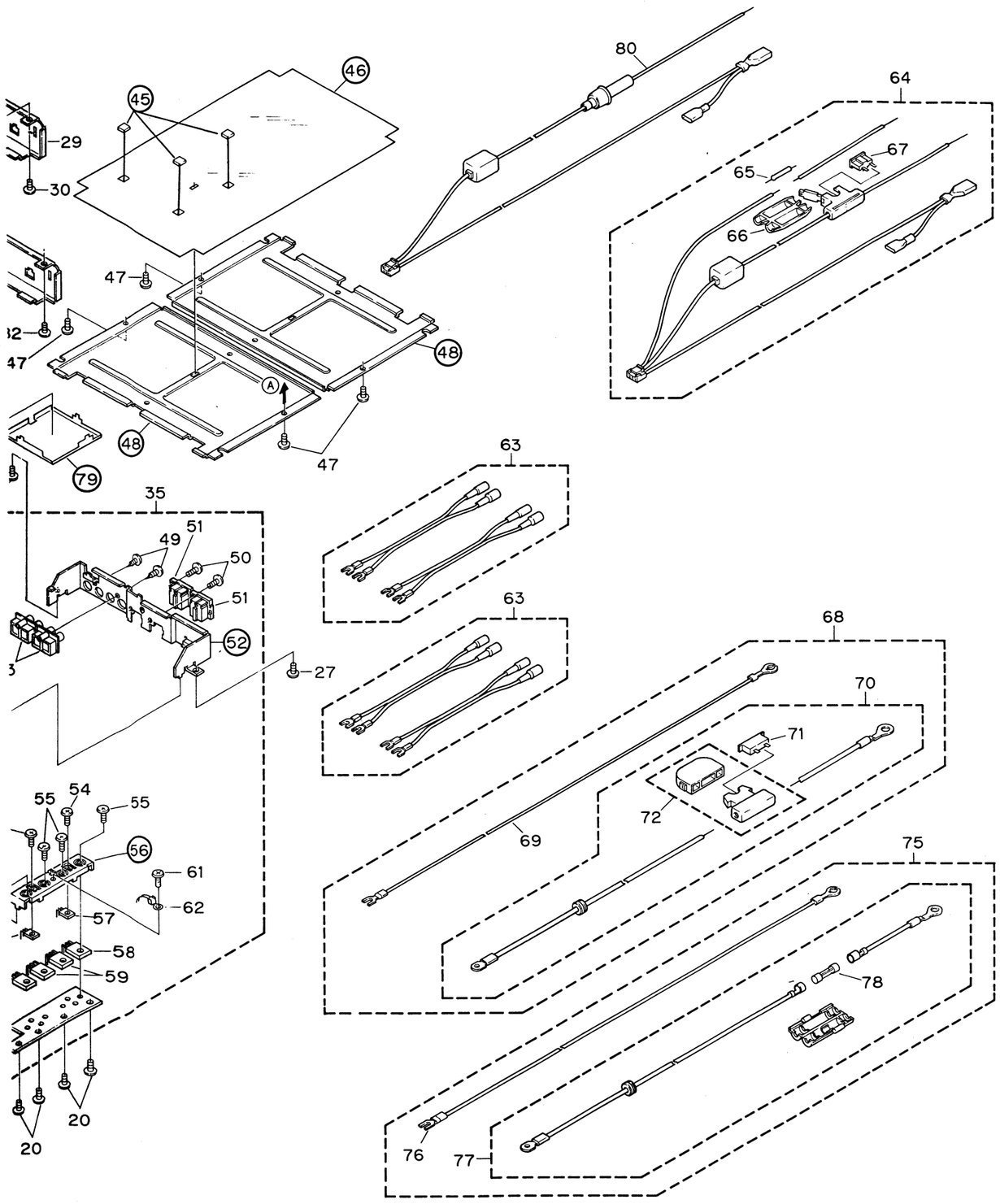


Fig. 10

● Parts List

NOTE:

- *The parts marked with "◉" may need long time to supply and their supply is subject to refuse as the case may be.*
- *Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.*

Mark No.	Description	Part No.
1	Lens	CNS2053
2	Heat Sink(UC)	CNR1195
	Heat Sink(EW)	CNR1211
3	Screw(EW)	BBZ30P050FMC
4	Panel(EW)	CNB1467
5	Cover	CNS2227
6	Cover	CNS2211
7	Screw	BMZ30P100FMC
8	Screw	BMZ30P080FMC
9	Screw	BMZ30P080FMC
10	Screw	BMZ30P080FMC
11	Bracket	CNC3425
12	Bracket	CNC3424
13	Transistor	2SD1707
14	Transistor	2SB1156
15	Transistor	2SC1568
16	Diode	RBV-602L
17	FET	2SK1191
18	Heat Sink	CNC3441
19	Heat Sink	CNC3442
20	Screw	BBZ30P100FMC
21	Auto Fuse Holder	CKR1004
22	Terminal	CKE1019
23	Terminal	CKE1018
24	Bracket	CNC3609
25	Screw	PPZ20P080FZK
26	Screw	PPZ30P100FZK
27	Screw	BBZ30P050FMC
28	Fuse	CEK1140
29	Panel(EW)	CNB1438
30	Screw(EW)	BBZ30P050FMC
◉ 31	Volume Unit(UC)	CWG1031
	Volume Unit(EW)	CWG1030
32	Plug	CKS1039
33	Plug(EW)	CKS1039
34	Plug	CKS1045
◉ 35	Amp Unit(UC)	CWH1114
	Amp Unit(EW)	CWH1113
36	Holder	CNC3611
37	·····	
38	Connector	CDE3194
39	Connector(EW)	CDE3194
40	Connector	CDE3195
41	Plug	CKS1821
42	Holder	CNC3612
43	·····	
44	·····	
45	Spacer	CNM3075
46	Insulator	CNM3158
47	Screw	BBT30P060FMC
48	Case	CNB1470
49	Screw	PPZ30P100FZK
50	Screw(EW)	BMZ20P080FMC
51	Connector(EW)	CKS1156
52	Bracket	CNC3610
53	Jack	CKB1007
54	Screw	BMZ30P080FMC
55	Screw	BMZ30P100FMC
56	Bracket	CNC3425
57	Transistor	2SC1568
58	Transistor	2SD1707
59	Transistor	2SB1156
60	Heat Sink	CNC3441
61	Screw	BMZ30P050FMC
62	Thermister	CCX1010
63	Cord Assy	CDE3019
64	Cord Assy(EW)	CDE3308
65	Resistor(EW)	RS1/2P102JL
66	Cap(EW)	CNS1472
67	Fuse(EW)	CEK1134
68	Cord Assy(EW)	CDE3032
69	Cord(EW)	CDE3025
70	Cord(EW)	CDE3027
71	Fuse(EW)	CEK1140
72	Auto Fuse Holder(EW)	CKR1006
73, 74	·····	
75	Cord Assy(UC)	CDE3164
76	Cord(UC)	CDE3025
77	Cord(UC)	CDE3163
78	Fuse(UC)	CEK1117
79	Shield	CNC3862
80	Cord Assy(UC)	CDE3309
81	Panel(UC)	CNB1469
82	Screw(UC)	BBZ30P050FMC
83	Panel(UC)	CNB1468
84	Screw(UC)	BBZ30P050FMC

14. PACKING METHOD

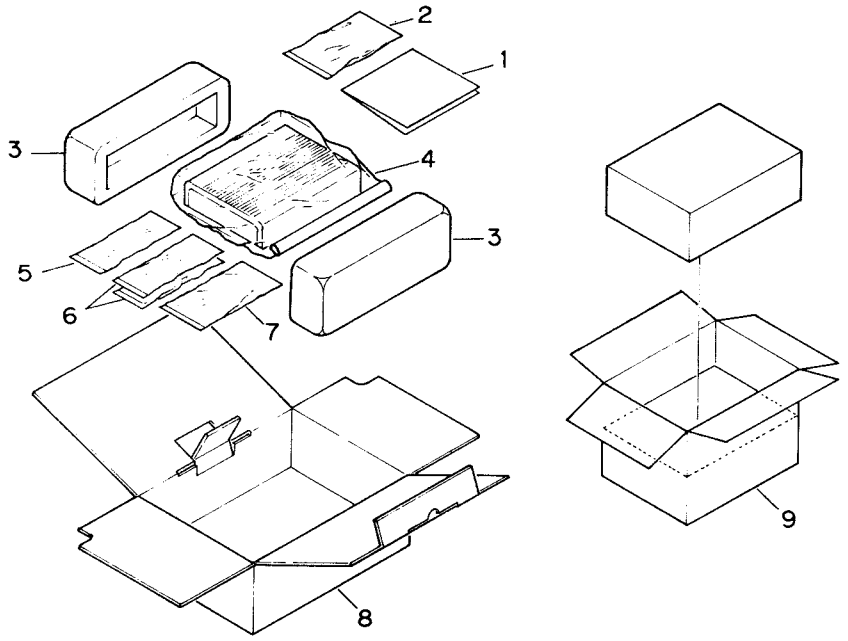


Fig. 11

● Parts List

NSP:Non Spare Part

Mark No.	Description	GM-H120/UC Part No.	GM-3400/EW Part No.
1-1	Owner's Manual	CRD1454	CRD1452
	Owner's Manual	·····	CRD1453
1-2	Card	NSP	·····
	Card	·····	NSP
2	Accessory Assy	CEA1652	CEA1652
2-1	Screw Assy	NSP	NSP
2-1-1	Screw (× 4)	HYC50P650FZK	HYC50P650FZK
2-2	Cover (× 2)	CNS2211	CNS2211
2-3	Cover	CNS2227	CNS2227
2-4	Driver	CNV2697	CNV2697
3	Styrofoam	CHP1397	CHP1397
4	Cover	CEG1100	CEG1100
5	Cord Assy	CDE3309	CDE3308
6	Cord Assy	CDE3019	CDE3019
7	Cord Assy	CDE3164	CDE3032
7-1	Cord	CDE3025	CDE3025
7-2	Cord	CDE3163	CDE3027
8	Carton	CHG1977	CHG1976
9	Contain Box	CHL1977	·····

* Owner's Manual

Part No.	Model	Language
CRD1454	UC	English, French
CRD1452	EW	English, French, German, Spanish
CRD1453	EW	Swedish, Norwegian, Dutch, Italian, Finnish

15. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

Chip Resistor

RS1/8S□□□J, RS1/10S□□□J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

● GM-H120/UC

Unit Number :
Unit Name : Volume Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	302 303		UPC4570HA
D	301		PR3432S
VR	301 302	Volume 10kΩ (A)	CCS1174

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	301 302 303 304		RD1/4PS271JL
R	305 306 307 308		RD1/4PS473JL
R	309 310 311 312		RD1/4PS473JL
R	313 314 315 316		RD1/4PS392JL
R	319 320		RD1/4PS331JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	301 302 303 304		CCPSL220J50L
C	305 307		CEWAS470M10
C	306 308		CEWAS101M10
C	309 310		CQFA473J50L

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	1 2 201 202		UPC4570HA
IC	451		TA8194Z
IC	452		UPC494C
Q	1 2 201 202 410 462 463 464		2SA1048
Q	3 4 203 204		2SC3327
Q	7 8 207 208		2SA1145
Q	9 10 209 210		2SC2705
Q	11 12 211 212		2SC1568
Q	13 14 213 214		2SC3421
Q	15 16 215 216		2SA1358
Q	17 18 217 218		2SD1707
Q	19 20 219 220		2SB1156
Q	21 22 221 222		2SD1768S
Q	406 407 408		2SD1864
Q	409 468		2SB1243
Q	451 452 453 454		2SK1191
Q	455 457		2SC3422
Q	456 458		2SA1359
Q	460		2SC3113
Q	461 465 466		2SC2458
Q	467		2SA1199S
D	1 2 201 202		1SS133
D	3 203 459 461		ERA15-02VH
D	401 403		HZS9B2L
D	402 404		HZS6B2L
D	412 413		RD16JSB1
D	451		RBV-602L
D	452 454 455 458		1SS133
D	453		RD9R1JSB2
D	456		RD6R8JSB2
D	457		RM4Z
D	462		HZ30P
L	1 2 201 202	Coil	CTH1028
L	451 452	Choke Coil	CTH1027
L	454	Coil 100μH	CTF-113
L	455	Coil	CTH1086
T	451	Transformer	CTT1015
RY	1 201	Relay	CSR1010
TH	451	Thermistor	CCX1010
SW	1	Switch (BFC)	HSH-156
VR	1 2 201 202	Semi-fixed 1.5kΩ (B)	VRT86VS152
EF	401 402	EMI Filter	CCG-081
FU	1	Fuse 30A	CEK1140

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	1 2 57 58 201 202 257 258 490		RD1/4PS222JL
R	5 6 205 206 475 484		RD1/4PS104JL
R	7 8 207 208		RD1/4PS274JL
R	9 10 11 12 209 210 211 212		RD1/4PS471JL
R	13 14 213 214		RD1/4PS681JL
R	15 16 33 34 215 216 233 234		RD1/4PS103JL
R	17 18 217 218		RD1/4PS104JL
R	31 32 35 231 232 235 489		RD1/4PS471JL
R	36 37 236 237		RD1/4PS363JL
R	39 40 41 42 239 240 241 242		RD1/4PS153JL
R	43 44 45 46 243 244 245 246		RD1/4PS681JL
R	47 48 49 50 247 248 249 250		RD1/4PS473JL
R	51 52 53 54 251 252 253 254		RD1/4PS161JL
R	55 56 255 256 416 417		RD1/4PS472JL
R	59 60 61 62 259 260 261 262		RD1/4PS473JL
R	63 64 263 264 492		RD1/4PS221JL
R	65 66 67 68 265 266 267 268		RD1/4PS100JL
R	69 70 71 72 73 74 75 76	0.22Ω/2W	CCN1013
R	77 78 277 278		RD1/4PS393JL
R	79 80 81 82 279 280 281 282		RN1/2P100JL
R	83 84 283 284		RD1/4PS564JL
R	85 86 285 286		RD1/4PS473JL
R	269 270 271 272 273 274 275 276	0.22Ω/2W	CCN1013
R	410 481		RD1/4PS223JL
R	412 414 491		RD1/4PS152JL
R	413 415 463 464		RD1/4PS332JL
R	451 452		RD1/4PM100J
R	453 454		RS1/2P220JL
R	455 456 469 470 474 476 478 485 498		RD1/4PS472JL
R	457		RD1/4PS273JL

Mark	Circuit Symbol & No.	Part Name	Part No.
R	458 465 479 483		RD1/4PS153JL
R	459 460 461 462		RD1/4PS820JL
R	466		RD1/4PS105JL
R	467		RD1/4PS102JL
R	468		RD1/4PS682JL
R	477		RD1/4PS124JL
R	480 482		RD1/4PS182JL
R	486		RD1/4PS822JL
R	487		RD1/4PS331JL
R	488		RD1/4PS123JL
R	493		RD1/4PS103JL
R	499		RD1/4PS182JL
R	500		RD1/4PS183JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	1 2 201 202		CEZA2R2M50
C	3 33 34 203 233 234		CKCYB102K50
C	5 6 7 8 205 206 207 208		CEZA470M10
C	11 12 211 212		CCPSL470J50L
C	13 14 15 16 213 214 215 216		CCPSL330J50L
C	17 18 19 20 217 218 219		CCPSL220J50L
C	21 22 23 24 221 222 223 224		CQFAH224J50L
C	25 26 225 226		CQFA223J50L
C	27 28 29 30 227 228 229 230		CQFA333J50L
C	31 32 231 232		CEA222M25L2
C	35 235 401 404		CEA101M10L2
C	220		CCPSL220J50L
C	402 405		CEA331M6R3L2
C	403 406		CEA471M6R3L2
C	411 412 413 414 463		CEA470M16L2
C	451 452		CEA471M25L2
C	453 454	4700μF/25V	CCH1103
C	455 456	4700μF/16V	CCH1104
C	457 458		CQMA223J50
C	459 469		CEA101M16L2
C	460		CQPA102J2A
C	461		CEA2R2M50L2
C	464 465 472		CKCYF473Z50
C	466	470μF/16V	CCH-114
C	467		CEA4R7M35L2
C	468		CEA220M16L2
C	470	220μF/10V	CCH1036
C	473		CEA102M16L2
C	479 480		CKCYF473Z50

● GM-3400/EW

Unit Number :
Unit Name : Volume Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	301		TC4066BP
IC	302 303		UPC4570HA
Q	301		2SC2458
D	301		PR3432S
VR	301 302	Volume 10kΩ (A)	CCS1174
VR	303 304	Volume 10kΩ (C)	CCS1175

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	301 302 303 304		RD1/4PS271JL
R	305 306 307 308		RD1/4PS102JL
R	309 310 311 312		RD1/4PS273JL
R	313 314 315 316		RD1/4PS392JL
R	317 318		RD1/4PS472JL
R	319 320		RD1/4PS331JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	301 302 303 304		CCPSL220J50L
C	305 307		CEWAS470M10
C	306 308		CEWAS101M10
C	309 310		CQFA473J50L

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
IC	1 2 201 202		UPC457?HA
IC	401		TC4066BP
IC	451		TA8194Z
IC	452		UPC494C
Q	1 2 201 202 410 411 462 463 464		2SA104?
Q	3 4 5 6 203 204 205 206		2SC33?7
Q	7 8 207 208		2SA114?
Q	9 10 209 210		2SC27?5
Q	11 12 211 212		2SC15?8
Q	13 14 213 214		2SC34?1
Q	15 16 215 216		2SA13?8
Q	17 18 217 218		2SD17?7
Q	19 20 219 220		2SB11?6
Q	21 22 221 222		2SD17?8S
Q	401 402 403 404 459 461 465 466 470		2SC24?8
Q	405 406 407 408		2SD18?4
Q	409 468 469		2SB12?3
Q	451 452 453 454		2SK11?1
Q	455 457		2SC34?2
Q	456 458		2SA13?9
Q	460		2SC31?3
Q	467		2SA11?9S
D	1 2 201 202 406 407 408 409 410 411		1SS13?
D	3 203 459 460 461		ERA15-02VH
D	401 403		HZS9B?L
D	402 404		HZS6B?L
D	405		RD12J?B1
D	412 413		RD16J?B1
D	451		RBV-6?2L
D	452 454 455 458		1SS13?

Mark	Circuit Symbol & No.	Part Name	Part No.
D	453		RD9R1JSB2
D	456		RD6R8JSB2
D	457		RM4Z
D	462		HZ30P
L	1 2 201 202	Coil	CTH1028
L	451 452	Choke Coil	CTH1027
L	454	Coil 100μH	CTF-113
L	455	Coil	CTH1086
T	451	Transformer	CTT1015
RY	1 201	Relay	CSR1010
TH	451	Thermistor	CCX1010
SW	1	Switch (BFC)	HSH-156
VR	1 2 201 202	Semi-fixed 1.5kΩ (B)	VRTB6VS152
SW	2	Switch (DRIVE MODE)	CSH1025
EF	401 402	EMI Filter	CCG-081
FU	1	Fuse 30A	CEK1140

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	1 2 57 58 201 202 257 258 490 497		RD1/4PS222JL
R	5 6 205 206 475 484		RD1/4PS104JL
R	7 8 207 208		RD1/4PS274JL
R	9 10 11 12 209 210 211 212		RD1/4PS471JL
R	13 14 213 214		RD1/4PS182JL
R	15 16 33 34 215 216 233 234		RD1/4PS103JL
R	17 18 25 26 217 218 225 226		RD1/4PS104JL
R	19 20 219 220 467		RD1/4PS102JL
R	21 22 221 222		RD1/4PS223JL
R	23 24 223 224		RD1/4PS563JL
R	31 32 35 231 232 235 489		RD1/4PS471JL
R	36 37 236 237		RD1/4PS183JL
R	39 40 41 42 239 240 241 242		RD1/4PS153JL
R	43 44 45 46 243 244 245 246		RD1/4PS681JL
R	47 48 49 50 247 248 249 250		RD1/4PS473JL
R	51 52 53 54 251 252 253 254		RD1/4PS161JL
R	55 56 255 256 407 408 416 417 418		RD1/4PS472JL
R	59 60 61 62 259 260 261 262		RD1/4PS473JL
R	63 64 263 264 492		RD1/4PS221JL
R	65 66 67 68 265 266 267 268		RD1/4PS100JL
R	69 70 71 72 73 74 75 76	0.22Ω/2W	CCN1013
R	77 78 277 278		RD1/4PS393JL
R	79 80 81 82 279 280 281 282		RN1/2P100JL
R	83 84 283 284		RD1/4PS564JL
R	85 86 285 286 406		RD1/4PS473JL
R	269 270 271 272 273 274 275 276	0.22Ω/2W	CCN1013
R	401 405 473 493 494 495		RD1/4PS103JL
R	402		RD1/4PS222JL
R	403		RD1/4PS393JL
R	404 413 415 463 464		RD1/4PS332JL
R	409 410 411 481		RD1/4PS223JL
R	412 414 491		RD1/4PS152JL
R	419 499		RD1/4PS182JL
R	451 452		RD1/4PM100J
R	453 454		RS1/2P220JL
R	455 456 469 470 474 476 478 485 496 498		RD1/4PS472JL
R	457		RD1/4PS273JL
R	458 465 479 483		RD1/4PS153JL
R	459 460 461 462		RD1/4PS820JL
R	466		RD1/4PS105JL
R	468		RD1/4PS682JL
R	472 480 482		RD1/4PS182JL
R	477		RD1/4PS124JL
R	486		RD1/4PS822JL
R	487		RD1/4PS331JL
R	488		RD1/4PS123JL
R	500		RD1/4PS183JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	1 2 201 202		CEZA2R2M50
C	3 203		CKCYB472K50
C	5 6 7 8 205 206 207 208		CEZA470M10
C	9 10 209 210		CEZA100M16
C	11 12 211 212		CKPYB101K50L
C	13 14 15 16 213 214 215 216		CCPSL330J50L
C	17 18 19 20 217 218 219		CCPSL220J50L
C	21 22 23 24 221 222 223 224		CQFAH224J50L
C	25 26 225 226		CQFA223J50L
C	27 28 29 30 227 228 229 230		CQFA333J50L
C	31 32 231 232		CEA222M25L2
C	33 34 233 234		CKCYB102K50
C	35 235 401 404		CEA101M10L2
C	220		CCPSL220J50L
C	402 405		CEA331M6R3L2
C	403 406		CEA471M6R3L2
C	407 408 411 412 413 414 463		CEA470M16L2
C	409		CEA100M16L2
C	451 452		CEA471M25L2
C	453 454	4700μF/25V	CCH1103
C	455 456	4700μF/16V	CCH1104
C	457 458		CQMA223J50
C	459 469		CEA101M16L2
C	460		CQPA102J2A
C	461		CEA2R2M50L2
C	464 465 472		CKCYF473Z50
C	466	470μF/16V	CCH-114
C	467		CEA4R7M35L2
C	468		CEA220M16L2
C	470	220μF/10V	CCH1036
C	473		CEA102M16L2
C	475		CKCYF223Z50
C	476 477 478		CKCYF473Z50
C	479 480		CKCYF473Z50